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THE TRAINING AND EMPLOYMENT

OF

GRENADIERS.

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CONTENTS.

THE TRAINING AND EMPLOYMENT OF GRENADIERS.

GENERAL PRINCIPLES.

1. The nature of operations in the present campaign has developed the employment of rifle and hand grenades both in attack and defence to such an extent that the grenade has become one of the principal weapons in trench warfare. Every infantry soldier must, therefore, receive instruction in grenade throwing. It has been found in practice, however, that some men do not possess the temperament or the qualifications necessary to make a really efficient grenadier. For this reason in every platoon there should be a nucleus of 1 N.C.O. and 8 men with a higher degree of training and efficiency as grenadiers than the remainder. These men will be available either to work with the platoon or to provide a reserve of grenadiers for any special object. They should be selected from the very best, bravest and steadiest in emergency. Preference should be given to tall men as height and length of reach are an advantage. It has been found that men who are fond of outdoor games are the easiest to train.

2. As grenade fighting will equally play an important part in the dismounted action of cavalry the foregoing principles are applicable to that arm and at least 1 N.C.O. and 4 men in each troop should be specially trained as expert grenadiers.

3. The object of grenade training is threefold :—

(i) To give the individual a practical knowledge of the mechanism of the standard types of grenades.

(ii) To teach him how to throw them.

(iii) To make him acquainted with the general principles of the organisation and execution of a grenade attack either as a separate operation or as part of a general attack.

4. Responsibility for training rests with battalion and company commanders. In cases, however, where troops have had no previous experience in this form of warfare, it will be desirable to form classes for the training of instructors in the first instance.

5. In each battalion one subaltern officer should be selected as battalion grenadier officer for instructional purposes. He will also supervise the supply and storage of grenades and assist company commanders as required.

A N.C.O. should be selected in each company to assist in the training of the grenadiers in the company. He will be available also to supervise the supply and storage of the grenades on charge of the company.

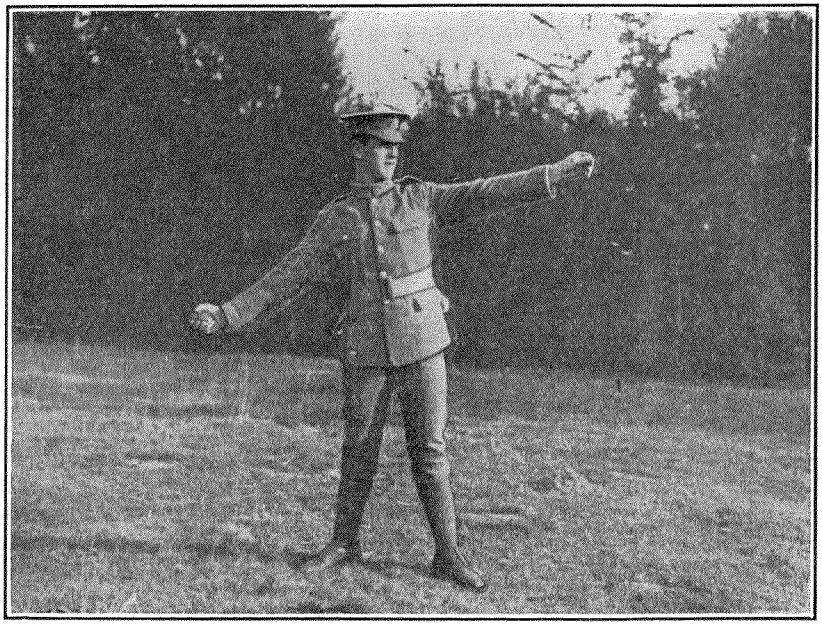
TRAINING.

6. The first step in training men as grenadiers is to overcome their natural fear of the grenade itself. This can be done by explaining how the grenade is used, the method of lighting and, above all, the time taken for the fuze to burn. It is advisable to light a piece of fuze of the required length and make the men count until it is burnt out. The men should then be instructed in lighting dummy grenades themselves and should see how long it takes for the fuze to burn.

7. The next step is to develop accuracy in throwing. Distance is of great importance in order to establish superiority over the enemy by outranging him. (*See* Plates 1-7 below). The grenade should normally be bowled overhand; it is rarely possible to bowl it underhand. For short distances, it can be lobbed from the shoulder by an action similar to that employed in "putting the weight." Stick grenades can be thrown for short distances like a dart. In a trench it should not be thrown like a cricket ball, as there is a danger of knocking the hand against the back of the trench and causing it to explode. The men should be taught that if a grenade with a time fuze is dropped in the act of throwing there is ample time to pick it up and throw it out of the trench before it explodes, and that they must do this immediately.

Men must be taught to throw from a standing, kneeling and prone position.

PLATE 1.

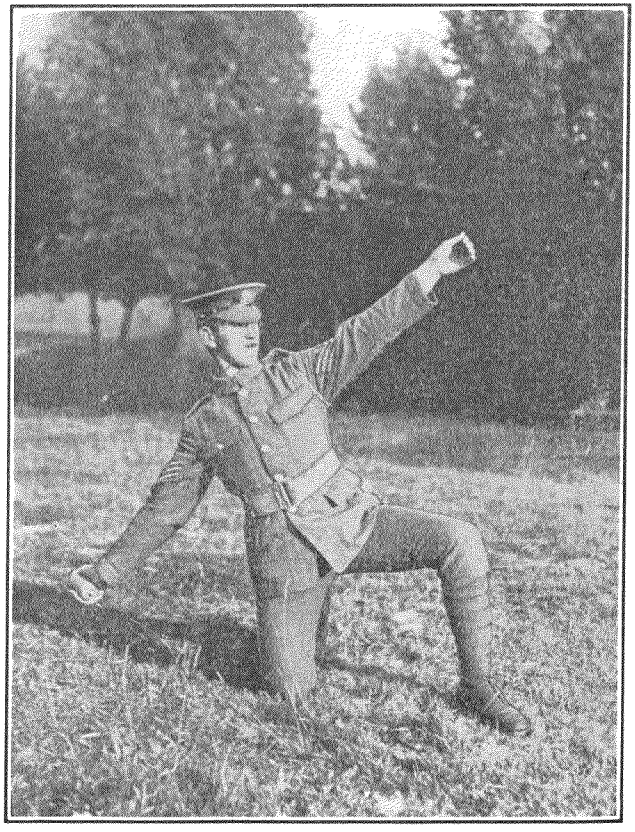


Correct Method of throwing a Grenade—Standing.

PLATE 2.

Correct Method of throwing a Grenade—Standing.

PLATE 3.



Correct Method of throwing a Grenade—Kneeling.

8. The following precautions against accidents must be taken during practice :—

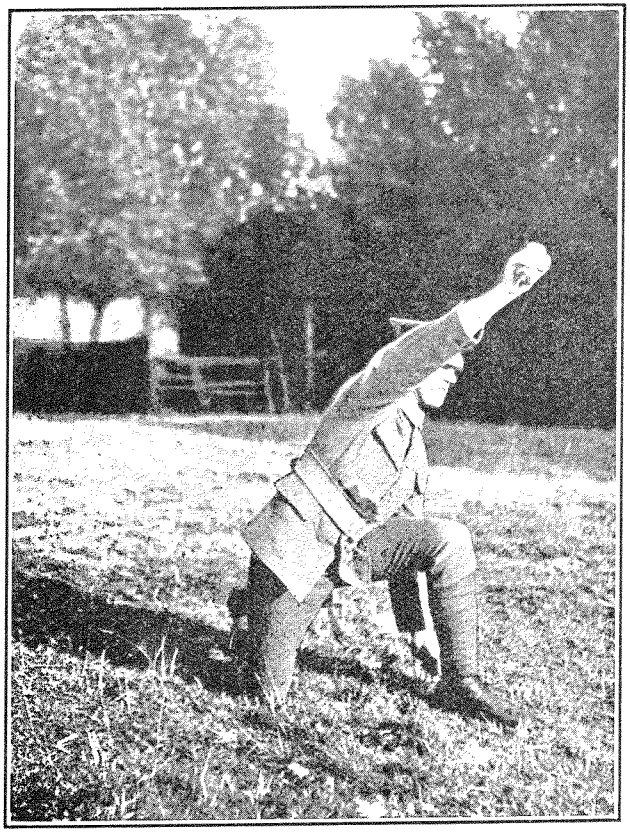
(*a*) Live grenades should be handled with care. Grenades other than those which are permanently "live" (*e.g.*, French pear shaped grenade (percussion), etc.) should not have the detonator inserted until just before they are going to be thrown in practice. (*See* also para. 23.)

(*b*) No safety pin should be removed, or other safety arrangements tampered with, except immediately before throwing the grenade.

(*c*) As soon as a grenade is "lit," by whatever method, it must be thrown at once even if doubts exist as to whether the fuze is alight.

(*d*) All joints must be made both damp-proof and flash-proof, both by waxing and by "crimping" (detonator on to fuze, and lighter on to fuze).

PLATE 4.



Correct Method of throwing a Grenade—Kneeling.

(*e*) Grenades should always be kept dry (in cupboards, etc., in the trenches).

(*f*) Hand grenades and rifle grenades, whether of service patterns or local make, which have been used as dummies for practice in throwing, or firing, are liable to become damaged and unreliable, and are therefore not to be used subsequently as "live" grenades.

(*g*) Every box of safety fuze should be tested for time of burning before being used for grenades.

A syllabus for guidance in elementary and advanced training is given in Appendix 1.

PLATE 5.

Correct Method of throwing a Stick Grenade.

EMPLOYMENT OF GRENADIERS IN THE ATTACK.

9 Preparatory Measures.

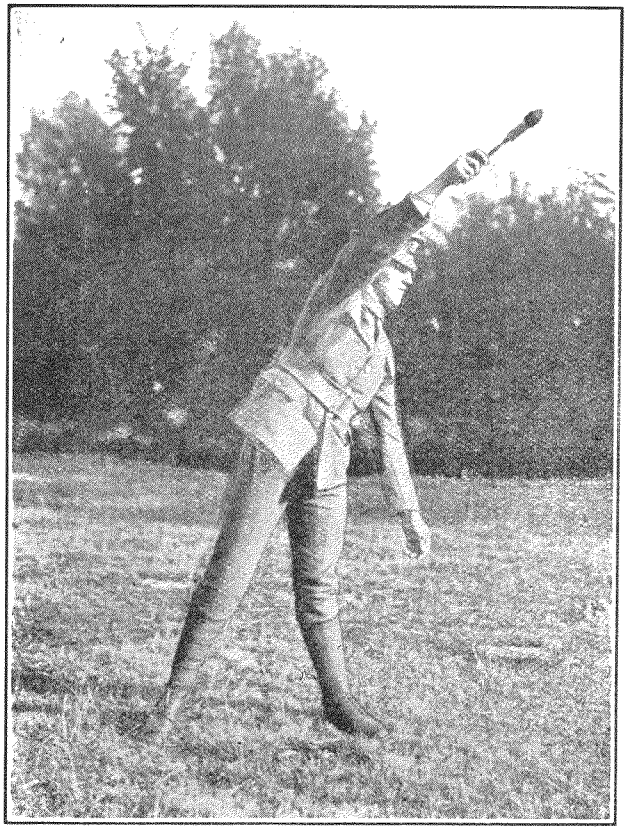
Before committing a party to the attack, the following preparatory measures must be taken:—

(*a*) A careful study of the enemy's trenches and communication trenches must be made by all concerned. Aeroplane photographs are of great assistance in this respect.

(*b*) Definite duties and objectives must be allotted to each party, and the size and composition of the party be arranged accordingly. The numbers detailed should allow for casualties.

(*c*) Arrangements must be made for the supply and replenishment of grenades (*vide*, para. 15, *et. seq.*), and all ranks should be acquainted with them and where grenades can be obtained.

PLATE 6.



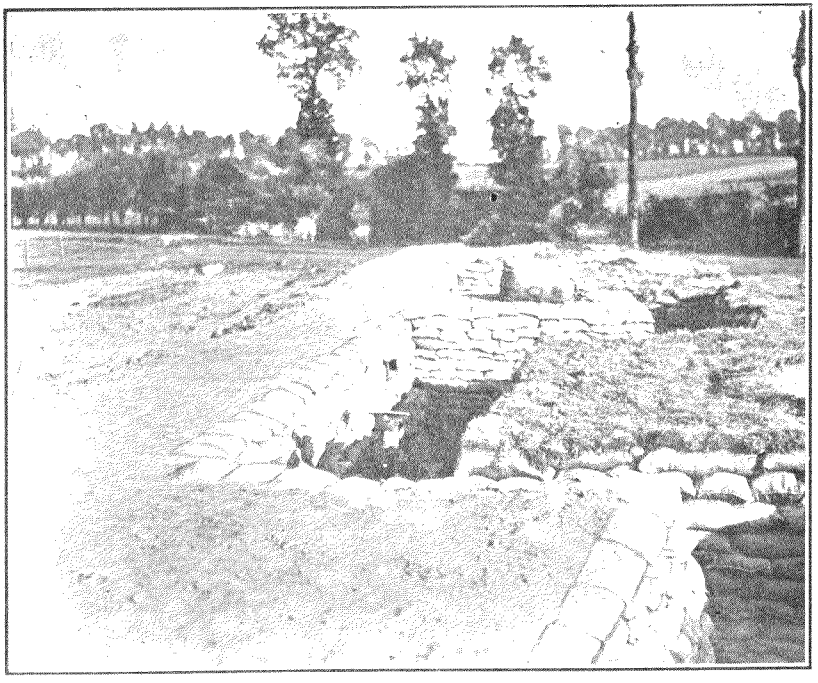
Correct Method of throwing a Stick Grenade.

(*d*) Each party must be provided with coloured flags or other means for marking its position in the captured trenches. On reaching the objective the flags should be planted in such a position that they can be seen by the supporting troops. The code of colours should be changed for each attack.

(*e*) Wherever practicable a rehearsal of the measures to be adopted should take place beforehand, the enemy trenches being marked out on the ground.

10. Grenadiers may be employed in advance of or with the assaulting lines. By creeping forward within throwing distance of the hostile trenches they can cover the bayonet assault with a shower of grenades. As a rule, however, grenadiers should be re-

PLATE 7.



Correct Method of throwing a Stick Grenade.

(For Short Distances only).

served for trench work and parties should move close in rear of the front line of infantry. A party should be directed on each point at which a communication trench leads back from the hostile front line and other parties should be detailed to clear the first line trenches laterally, in order to join up with the battalions on either flank or if the attack of these has failed, to assist them and at the same time protect the flanks of their own battalion.

Each grenadier party should understand clearly the main objective of the attack as well as its own immediate objective and should also know how far beyond or to the flanks of such objective it is to proceed. Orders should be given in advance with regard to the fire and communication trenches which are to be stopped and the points at which this is to be done. As a rule it will be found that one party is sufficient for each communication trench.

11. Composition of Grenadier Parties.

The following is a suitable composition for a grenadier party :—

A N.C.O. in command.
Two bayonet men.
Two grenade throwers.
Two carriers.
Two spare men.

Whenever possible the N.C.O. in command should personally inspect each man of his party before the attack begins. In clearing a trench he should place himself where he can best supervise the work of his party and direct its action.

Bayonet men must be selected from those who are quick shots and good bayonet fighters. The magazines of their rifles must be kept charged and one round in the chamber. Their duty is to protect the throwers at all costs.

As every class of grenade, whether it has a safety pin or fuze lighter, requires two hands to fire it, it is essential that grenade throwers should have both hands free for use.

Carriers must keep a close watch on their respective throwers and have a grenade handy when required. They must be careful not to get too close to the throwers and so cramp them while they are throwing. They must be thoroughly trained in the duties of throwers and be ready to take their places in case of casualties.

Spare men should carry the same amount of grenades as the carriers and are responsible for keeping them supplied.

Both spare men and carriers should be trained in passing grenades rapidly from man to man to the throwers in front (*see* also para. 12).

12. The Conduct of the Attack.

For carrying out continuous operations, a succession of parties organized as in para. 11 may be arranged, or each of them may be followed by the remainder of the platoon armed with rifles and carrying sandbags, shovels, etc. ; in the latter case the leading men of the remainder of the platoon should carry two boxes of grenades as a reserve supply, and two more boxes should be carried by the rear men of the platoon.

The first method has the advantage that if a side lateral communication trench is encountered during the course of the attack, the second party can work along it without a check.

The second method enables the platoon to make good the ground gained by its grenadier party when that party is unable to make further progress ; a second platoon preceded by its grenadier party might then pass through the first and continue the advance with a fresh supply of grenades.

13. All grenadiers must have a knowledge of the best methods of blocking a trench. In all attacks they should be supported by a party of sandbag men, under an experienced N.C.O., so that, whilst the grenadiers are keeping the enemy at bay, a strong barricade can be built as quickly as possible.

If possible, it is advisable to bomb along the trench for a distance of 50 yards or so further than the point to be barricaded. The reason for so doing is to drive the enemy back out of bombing distance. A second barricade of a temporary nature should then be erected and constant fire kept up by the grenadiers, so that the sandbag party can pull down the trench between the two blocks. It is advisable, as a rule, to attach a small number of Engineers to the party, with a view to blowing down the enemy's trench by explosives. As soon as a clear field of fire has been established from the point to be held, the grenadiers retire from the advanced barricade.

In making a permanent barricade, provision must be made for dug-outs for the grenadier party and riflemen. The best form of dug-out is one built off the main trench in a "T" shape. This should be protected from counter grenade attacks by wire netting, and a grenade depot should also be built.

It is of advantage to dig a sap leading towards the enemy from each side of the trench which has been blocked, somewhat in the form of a "trident." Grenades can thus be thrown into the blocked trench from three points simultaneously. (See diagram below.)

14. The following is an example of the methods of working along an enemy's trench which have been found successful in recent attacks (*see* Plates 8 and 9).

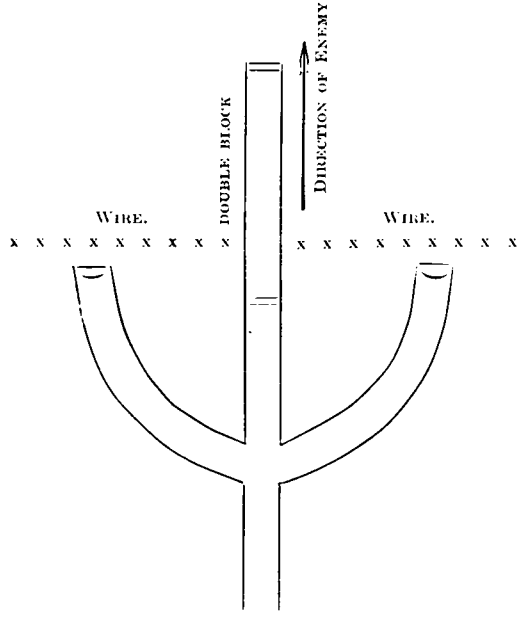


PLATE 8.

Grenadier Party working round a Traverse.

PLAN OF ATTACK.

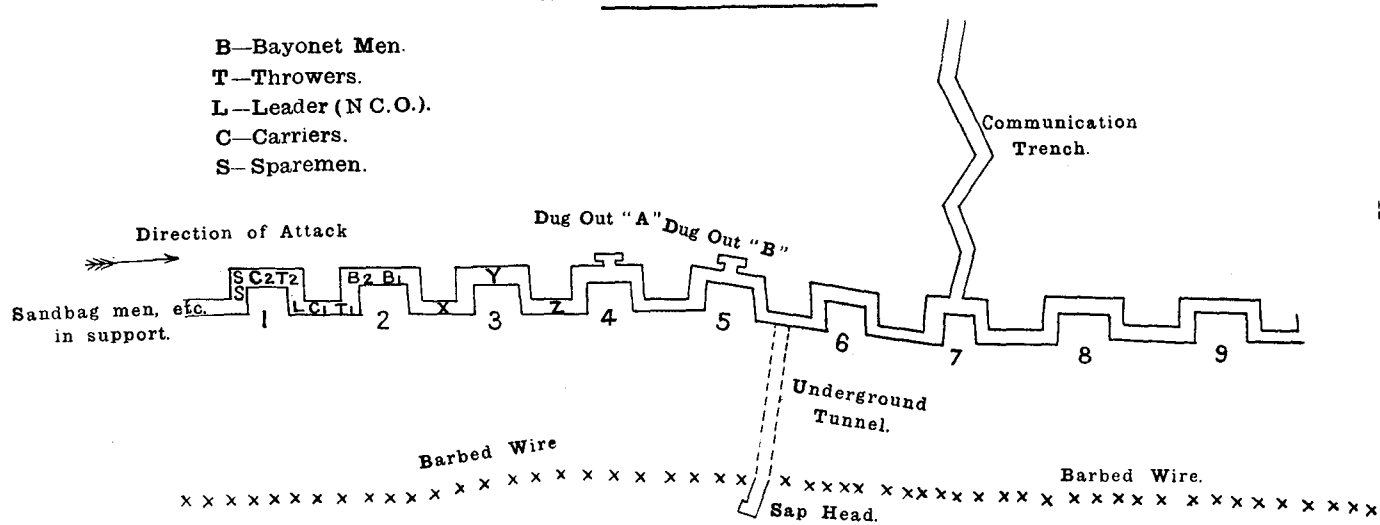


PLATE 9.

On arriving at traverse 2, the bayonet men place themselves in positions B 1 B 2, the first thrower at T 1, behind the traverse, the first carrier immediately behind him at C 1, the N.C.O. or leader at L in such a position that he can observe the fire and direct his squad. Behind him are the second thrower, second carrier and spare men. As a rule there will not be room in a trench for two men to throw grenades at the same time without crowding. In support further behind are the remainder of the platoon, machine gun detachments, etc.

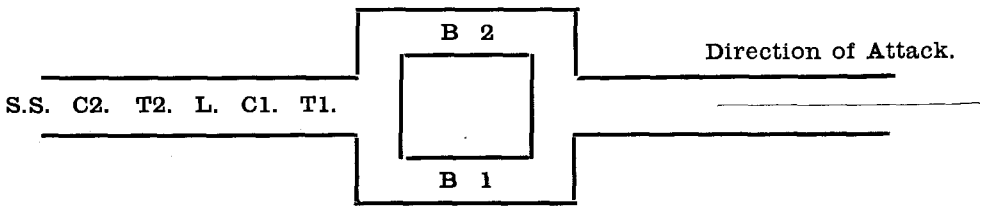
As soon as the party jumps into the trench the leader directs the first thrower to open fire. The first thrower throws grenades as quickly as possible into the next two trenches (X and Y), and over traverse 3 into trench Z.

The leading bayonet man on receiving the order "Report" from the leader then moves forward so as to be able to see into X and Y. If these are clear he passes back word, and the whole party, on receiving the order "Advance," take up positions at traverse 3 similar to those taken up at traverse 2. In this way the party work down the trench throwing grenades into any shelters they may encounter on the way.

In the event of a communication trench being encountered as in Plate 9, a second party should be brought forward to work along it, the original party proceeding along the main trench until the objective is reached. If a second party is not available, the leader must send the second bayonet man, thrower and carrier to work down the trench in question, followed by sandbag men and if necessary by riflemen from the platoon.

Should an "island traverse" (*See* Plate 10) be encountered, the leading bayonet men must watch both sides of it whilst the grenadiers are throwing grenades.

PLATE 10.



15. Replenishment of Grenades.

The success of a grenade attack depends largely upon a regular and ample supply of grenades to the throwers in front: this question is therefore a matter of the greatest importance, particularly after the hostile trenches have been captured.

Prior to the delivery of the attack, depots of grenades should be established along the whole front system of trenches, and particularly along the communication trenches, in which a number of grenade stores capable of holding a small number of grenades should be prepared at frequent intervals and be clearly marked. The further grenades have to be carried during an attack, the smaller will be the numbers which actually reach the leading troops. Moreover, communication with the rear may be cut off by hostile artillery fire. It is preferable to distribute a number of small depots conveniently along the whole front of attack than to store large numbers in one or two places.

16. The following initial distribution is suggested :—

(*a*) Grenades, on a scale of 3 grenades per man, to be issued in bulk to those units detailed to open the attack, the issue being made in sufficient time to enable them to be distributed as required.

(*b*) Small depôts to be established at frequent intervals along the trenches from which the attacking columns will start.

(*c*) Other depots to be established in the support and assembly trenches. These latter should be close to the junction of these trenches with the communication trenches.

(*d*) A central brigade depot to be established still further in rear from which these advanced depôts can be replenished.

Adequate bomb proof cover must be provided for these depots (*see* para. 23).

17. All bodies of men sent forward in support of the attack should carry grenades. The issue of these grenades should be made from the rearmost depots if possible, so as not to deplete those further forward.

18. Additional reserves of grenades will be required and arrangements for replenishing the depots must be worked out beforehand.

As it will rarely be possible for wheeled transport to approach the trenches. special parties should be detailed in advance to carry grenades forward from the wagons to the depots.

19. In the enemy's trenches supplies of his grenades are usually to be found. Grenadiers should, therefore, know how to use them. Details of the construction of German grenades are given in Appendix 4.

EMPLOYMENT OF GRENADIERS IN THE DEFENCE.

20. The ordinary course of normal trench warfare must be considered in addition to the dispositions to be adopted for meeting an actual attack.

The main Infantry defence of a line of trenches against hostile Infantry will be by rifle and machine gun fire. Parties of grenadiers, however, should be distributed throughout the front system of trenches for special purposes. Except in those parts of the line where the enemy's trenches are within bombing distance, grenadier parties need not actually be located in the fire trenches. The best position for them is in the support trenches close to the main communication trenches leading to the fire trenches, whence they can make an immediate counter-attack should the enemy succeed in gaining a footing.

Where mine craters, sapheads, hollows, etc., provide ground which neither rifle nor machine gun fire can cover, grenadier posts should be established so as to deny such points to the enemy should he be successful in occupying them. Such posts should be sheltered as far as possible from enemy grenades by wire netting and small traverses.

The action of grenadier parties should be laid down in the scheme of defence of each section of the line, and each should be practised in carrying out its particular rôle, so that every member of it may know what he has to do.

21. A "bombing trench" dug about 20 yards behind the front trench from which grenades can be thrown into the front trench is an advantage.

22. Saps forward from the front trench should be covered to beyond bombing distance from the front trench with a network of overhead wire of about 1 foot mesh. This will prevent parties of the enemy who may capture the sap from throwing their grenades into the front trench, but will not prevent the grenades of the defenders from falling among the enemy in the sap. The head of the sap should not be wired so that when it is occupied by the grenadiers of the defence they can throw their missiles from it to both front and flanks.

23. Grenades stored in the trenches should be kept ready fuzed with the detonators inserted. Each company in the front line should have a supply on company charge. These should be distributed in a number of dry and closed bomb-proof depots established at frequent intervals in the trenches, in the "bombing trench" referred to in para. 21, and near the head of communication trenches. These depots should be well marked, easily accessible and kept distinct from other stores. A good type of grenade depot is one built in a "T" shaped trench off the main trench. The grenades should be enclosed in tin lined boxes in the depots to prevent deterioration. Old ammunition boxes are suitable for the purpose.

Appendix 1.

SUGGESTIONS FOR SYLLABUS OF TRAINING.

A.—ELEMENTARY.

The following subjects should be included in the course, the duration of which must depend on circumstances. As a rule about a week should be sufficient.

1. Lectures on handling grenades. Causes of accident and measures of precaution.
2. Instruction in throwing the various kinds of grenades.
3. Description of grenades and detonators. Methods of detonating and firing.
4. Methods of throwing grenades in attack and defence. Organisation of grenadier parties.
5. Summary of course, and short test.

B.—ADVANCED.

1. The object of the training is to teach men to throw all types of bombs as accurately as possible at long and short ranges both in attack and defence.
2. Details of German grenades should be explained as well as of British and French.
3. Physical fitness is essential. Men should be exercised daily in running, marching, Swedish drill, etc., to keep them fit and supple. They should also throw dummy grenades.
4. Great attention should be paid to accuracy of length, which is as important as accuracy of direction.
5. Attack practice should be carried out above ground against a fire trench and while on the move, also in a trench extending laterally from a section of captured trench by traverse to traverse bombing. Men should be taught not merely to throw over a traverse, but at least into the space beyond the second traverse from them. They should also be taught to throw into "dug-outs," junction of communication trenches and sap heads.
6. Defence practice should be carried out from a trench against another trench or area representing a wire entanglement.
7. Various types of trench should be provided for practice; *e.g.*, traversed trenches with varying distance between traverses, zig-zag communication trenches, etc.

8. During the Course, tests should be held which the man must pass **before proceeding** to further instruction. Similarily at the end of the Course a **final test should be** held.

Details of suitable tests are given below.

First Test.—Dummy grenades to be used.

(*a*) Position. Standing in a trench 3 feet wide and 4 feet deep, to throw over a traverse 5 feet high.

(*b*) Distance. Minimum distance 20 yards.

(*c*) Accuracy. The grenade to fall direct into the trench.

(*d*) Number of throws. Ten, of which six must fall into the trench.

(*e*) Dimensions and trace of trench to be used. In accordance with plan on Plate 11.

Second Test.—Dummy grenades to be used.

Throwing in the open at measured distances into a trench in 3 positions:—

(i) Standing at 30—35 yards.

(ii) Kneeling at 20 yards.

(iii) Lying at 20 yards. Also lying with wire between the thrower and the objective.

Ten dummies to be thrown, of which six must be thrown *into* the trench.

Final Test.

(*a*) As for 1st and 2nd Tests, but "live" grenades to be used.

(*b*) Ten grenades to be thrown, of which five must be thrown into the trench.

(*c*) Stripping grenades of each type.

(*d*) Questions on properties of grenades, detonators, fuzes and lighters.

(*e*) Questions on care and handling of grenades.

(*f*) Questions on Trench Tactics.

Note.—This syllabus is for guidance only. It can be amplified or modified at discretion.

PLATE 11.

Minimum distance 20
17
3
Parapet
Traverse
Trench
Traverse
Trench
3'
Two sticks placed in the ground to assist the thrower in direction
The dotted portions need not be made, as they do not affect the test. Portions shaded or marked in continuous lines must be made.

Appendix 2.

SPECIAL EQUIPMENT.

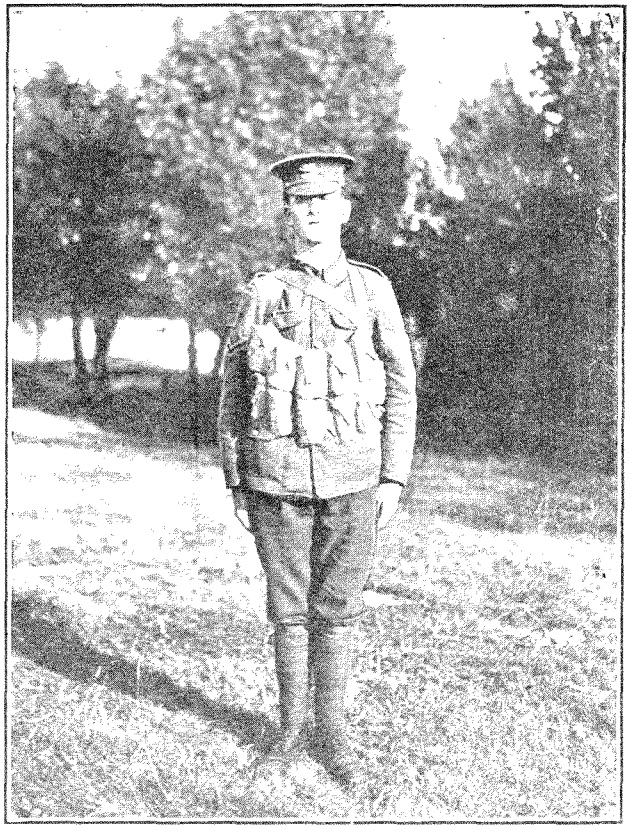
The following types of carriers for grenades have been found useful:—

(a) A basket or box similiar to the machine gun belt-box, with strap handle, and fitted inside to take the grenades in use.

(b) A leather belt, which goes three-quarters round the body, and has pockets in front for the grenades. The belt is supported by two straps attached in front, which are passed under the shoulder straps, then through loops on the ends of the belt, and finally brought round the waist and tied in front.

(c) A haversack with six pockets with stud, the mouth of the pocket being slightly smaller than the bottom. Each pocket will hold two grenades No. 1 with streamers, or one of other patterns.

PLATE 12.

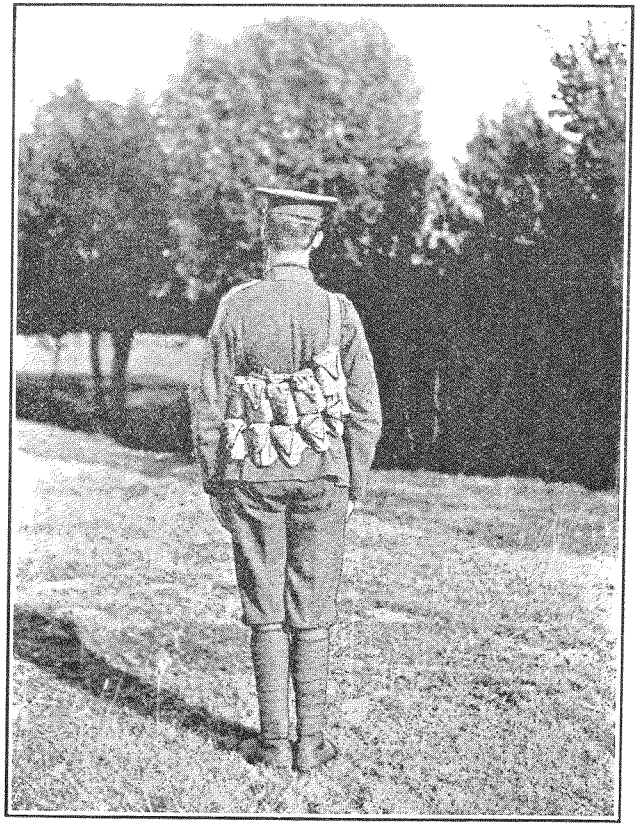


Waistcoat Grenade Carrier.

The strap is two inches wide and is continued along the whole length of the carrier for purposes of greater strength.
It is fitted with a buckle in order that the length can be adjusted. It is coloured khaki (*see* Plate 15).

(d) A waistcoat which is packed in the boxes containing grenades Nos. 6 and 7. Each waistcoat can carry ten grenades (*see* Plates 12 & 13).

PLATE 13.



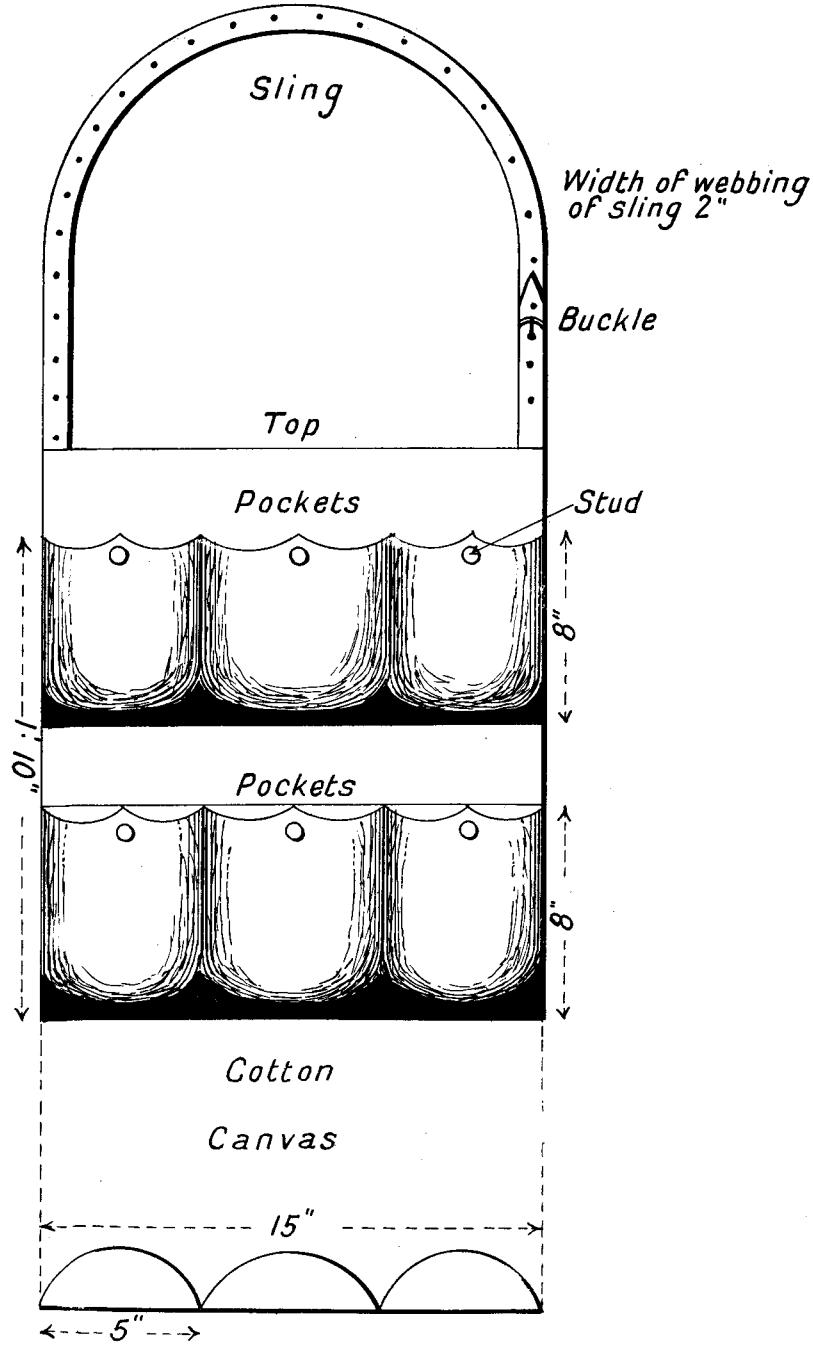
Waistcoat Grenade Carrier.

(e) A carrier for the stick grenades made of a belt of canvas 3" wide and 3' long, tied with tapes at the back. Eight loops are made in the belt to take the grenades, and supporting straps go over the shoulders to take the weight, (*see* Plate 14).

PLATE 14.

Stick Grenade Carrier.

PLATE 15.


Sling
Width of webbing of sling 2"
Buckle
Top
Pockets
Stud
8"
10"
Pockets
8"
Cotton
Canvas
15"
5"

Appendix 3.

DESCRIPTION OF BRITISH GRENADES

AND

INSTRUCTIONS FOR THEIR USE.

(i.) The following types of Grenades have been issued :—

PREVIOUS NOMENCLATURE.	NEW NOMENCLATURE.
Service Hand Grenade (R.L. Percussion, Brass with Cane Handle & Detonator)	**Grenade, Hand, No. 1.**
Tonite or Mexican Hand Grenade (Hale's Percussion Pattern, Brass with Cane Handle and Detonator)	**Grenade, Hand, No. 2.**
Hale's Rifle Grenade (J. A. Pattern with Detonator)	**Grenade, ·303" Short Rifle No. 3.**
Mill's Hand Grenade (Iron Oval Shaped with Safety Fuze and Detonator)	**Grenade, Hand, No. 5.**
R.L. Grenade 1-lb. (R.L. Light Friction Pattern, Tin, with Friction Igniter and Detonator)	**Grenade, Hand, No. 6.**
R.L. Grenade 2-lbs. (R.L. Heavy Pattern, Tin, with Friction Igniter, Safety Fuze and Detonator)	**Grenade, Hand, No. 7.**
Double Cylinder Light Pattern Grenade (with No. 8 Detonator and Safety Fuze)	**Grenade, Hand, No. 8.**
Double Cylinder Heavy Pattern Grenade (with No. 8 Detonator and Safety Fuze)	**Grenade, Hand, No. 9.**
Hairbrush or Box Pattern Grenade (Tin and Steel with Wood Handle, with Igniter, Safety Fuze, Percussion and No. 8 Detonator)	**Grenade, Hand, No. 12.**
Battye Hand Grenade	
Pitcher Hand Grenade	
Oval Hand Grenade	
Ball Hand Grenade	

(ii.) These Grenades are of two kinds.

(*a*) Those that rely for their effect on fragmentation.
(*b*) Those that rely for their effect on detonation.

The ignition is either—

1. By percussion or
2. By time fuze.

As regards (*a*). This type should always be thrown from behind cover as the fragments are dangerous for a distance greater than that which the Grenade can be thrown.

The majority of the Grenades are of this type.

As regards (*b*). These Grenades are sometimes known as "Assault" Grenades. They can be thrown from the open and are most effective when thrown into a Trench. They are only effective for a distance of about 3 or 4 yards from where they fall.

Grenades ignited by percussion.

Only 3 Grenades belong to this category, Nos. 1, 2 & 3.

Grenades ignited by Time Fuze.

The remainder of the Grenades are ignited by some combination of lighter, time fuze, and detonator.

Time of burning for all these Grenades is about 5 seconds.

DETAILS OF THE VARIOUS GRENADES.

Grenade, Hand, No. I or Service Grenade, (Percussion)

(iii.) WEIGHT COMPLETE 2-lbs.

(*See* Plate 16.)

DESCRIPTION.—The grenade consists of a brass cylinder encircled by a narrow cast iron ring serrated to break up into 16 fragments.

The cylinder is mounted on a wood block to which a cane handle 5" long is attached. Four streamers are nailed to this end of the body. Total length of grenade $12\frac{1}{2}$".

The brass cylinder or body of the grenade is filled with explosive, and has its upper end closed by the detonator holder, fixed by three screws. This holder carries two pins for securing the detonator. The body has two knobs and two indicating stops fitted above the serrated ring.

The firing needle is carried in the removable cap, which has two grooves formed on it in which slide the knobs on the body. The cap is centrally pierced for the safety pin.

"Remove," "Travel," and "Fire" are marked on the outer surface of the cap. When the knobs on the body are opposite the word "Remove," the cap can be pulled off.

When opposite "Travel," cap cannot be moved.

When opposite "Fire," the cap can be pushed down so that the firing needle can pierce the detonator.

When the grenade is thrown, owing to its weighted head and streamer on handle, it will fall on its head and the firing needle will be forced into the detonator.

INSTRUCTIONS.

To prepare for use.

1. Remove the cap (leaving the safety pin in) and insert detonator by pushing it home and turning it to the left. Special detonators are provided with the grenades.

2. Replace cap and turn to "Travel."

To fire.

1. Turn to "Fire."

2. Immediately before throwing pull out the leather strip from the safety pin and free the becket.

3. Hold the grenade in the right hand, pull the safety pin with the left and throw.

Special precautions.

Great care should be taken to prevent the grenade from being jarred during the action of throwing.

Packing.

The grenades are packed 6 in a wooden box. Cylinders containing 10 detonators, No. 1 Hand Grenade. Marks I or II are issued separately.

NOTE—If the Grenade is not used the detonator can be removed and cap replaced and turned to "Travel."

Grenade No. 2 or Tonite or Mexican Grenade. (Percussion).

(iv.) WEIGHT COMPLETE: 1-lb.

DESCRIPTION. (*See* Plate 17.)

The grenade consists of :—

1. Handle.
2. Body.
3. Special detonator.

Handle.

Cane 7" long, roughened to prevent the grenade slipping out of the hand, total length $12\frac{1}{2}$"; a $1\frac{1}{2}$" tape, 1 yard long, is wound round this end and is kept in place by a thin binding thread. When the latter is broken, the tape is free to form a tail and so assist the grenade to fall on its head.

A small steel rod about 2" long, is fixed to the other end of the handle by means of a brass collar rivetted to the cane. The end of the steel rod screws into the body of the grenade.

Body.

Consists of a brass cylinder $4\frac{3}{4}$" x $1\frac{1}{4}$" diameter.

A band of ribbed cast iron is fixed on to the end near the head. This band :—

(*a*) helps to weight the head of the grenade.

(*b*) provides the necessary man killing fragments. There is a small tube passing down the centre of the large cylinder, and the intervening space is filled with explosive (Tonite). This tube contains the spring, striker and detonator (when loaded).

The striker consists of a brass rod $1\frac{1}{2}$" long with a conical head and steel needle point. A brass spiral creep spring $1\frac{1}{4}$" long is fixed round a groove in the head of the striker. This spring is sufficiently strong to prevent the needle reaching the detonator without a fairly strong blow.

The striker is held in position by a safety pin passing through the body of the grenade and the end of the striker.

Detonator.

Consists of a brass tube which can be screwed into the head of the grenade. The bottom of the detonator tube is closed by a thin brass plate. During transport the detonators are carried separate from the grenade, and a wooden plug is screwed in, in place of the detonator to keep out damp and dirt.

INSTRUCTIONS.

To prepare for use.

1. Untie the tape at handle.
2. Unscrew the wooden plug and insert the detonator. The grenade should be held head downwards when doing this, in order to make certain that the needle is secure.

To Throw.

1. Hold the grenade in the right hand.
2. Pull out the safety pin with the left hand.
3. Throw the grenade.

Action.

When the grenade leaves the hand, the weighted head and tape streamers cause it to fall on its head. On reaching the ground the body of grenade is stopped by the impact, and the striker being free, flies forward, compressing the spring sufficiently for the needle to pierce the detonator and thus explode the grenade.

Special precautions.

1. Great care should be taken to avoid jarring the grenades against any obstruction when in the act of throwing.
2. The grenade is in a very dangerous condition when once the safety pin has been removed, and special attention should be drawn to this.
3. The detonators for grenades Nos. 2 and 3 are of slightly different lengths but are otherwise very similar and care should be taken not to mix them up, as this will lead to failures of both grenades. The correct detonators are supplied in the boxes containing the grenades.

Package of Grenades.

The grenades are packed in wooden boxes containing 10 grenades, and a small box of 10 detonators: wooden partitions prevent movement of the grenades during carriage.

Hales Rifle Grenade. Short Rifle No. 3, Mark I. (Percussion)

(v.) WEIGHT COMPLETE: 1 lb. 5 ozs.

DESCRIPTION. (*See* Plate 18, Fig. 1.)

The grenade consists of a serrated steel body filled with explosive. Down the centre of the explosive is a brass tube into the forward end of which the detonator is inserted. The rearward end of the body is closed by the base piece which carries the needle pellet, two retaining bolts, wind vane and releasing socket with safety pin. To the base piece is fixed a base plug carrying the spring clip and a 10" steel rod.

INSTRUCTIONS.

To prepare for use.

1. Remove the ebonite block holding the grenade head down so as to make certain that the needle is not free.

2. If correct screw in the detonator.

To Fire.

1. Lower the rod into the barrel of the Rifle and clip over the muzzle.

2. Immediately before firing withdraw the safety pin.

Action.

The action of the grenade on being fired is as follows :—

The releasing socket sets back from under the wind vane, which is then revolved by wind pressure as the grenade travels through the air: after a few turns of the vane the retaining bolts are no longer held in position by its inner surface: on impact the needle pellet sets forward against the creep spring, on to the detonator cap, thus firing the grenade.

If, after the safety pin has been removed, the grenade is not used, the safety pin may be replaced if the screwed ring has not unscrewed and uncovered the two retaining bolts, but if these are uncovered the grenade is in a dangerously sensitive condition, and if so found it should be destroyed. Only the special detonators and cartridges provided should be used. If by accident a grenade were fired with a bulleted round, the rifle would probably burst and injure the firer.

This grenade is very safe to handle, as it cannot be fired by knocking or dropping on the ground ; it must travel through the air some distance before the retaining bolts fall out.

Special precautions.

1. Safety pin should not be removed before the Grenade has been inserted in the rifle.
2. Care should be taken not to mix up the detonators *vide* special precaution No. 3 under Grenade Hand No. 2.
3. Care must be taken not to fire the grenade with a bulleted round which may burst the rifle.

Packing.

The wooden box provided carries 20 grenades in protecting tins with screw off lids, 20 "detonators, rifle grenade" in four tin boxes with lever lids, and 22 special blank cartridges in a tin box.

Grenade, Hand, No. 5. Mark I, or Mills Hand-Grenade.

(vi.) WEIGHT COMPLETE : 1½ lbs.

DESCRIPTION. (*See* Plate 18, Fig. 2.)

The body of the grenade is of cast iron, serrated to provide numerous missiles on detonation. Into one end is screwed a centre piece with separate recesses for the striker and the detonator.

The striker is kept cocked against its spring by its head catching on the end of the striker lever, when the latter lies against the body of the grenade.

The lever is retained in this position by the safety pin.

The igniter is a separate unit consisting of cap, cap chamber, safety fuze, and detonator.

The action of the grenade is as follows :—

Withdraw the safety pin: on throwing the grenade, the lever swings outward under the pull of the striker spring, thus releasing the striker which fires the cap. The safety fuze burns about five seconds and then fires the detonator.

INSTRUCTIONS.

To prepare for use.

1. Unscrew the base plug and insert igniter.
2. Screw in the base plug taking care that it is screwed home.

To Fire.

1. Hold the grenade in the right hand in such a position that the lever is held securely against the body of the grenade by the fingers or thumb.
2. Withdraw the safety pin with the left hand, still keeping a firm grip on the lever.
3. Throw the grenade.

Special precautions.

It is essential that the lever should be held securely against the body otherwise the collar which pulls back the striker may release it and so ignite the fuze.

The precaution against using grenades as " live " grenades after they have been used as dummies for practice is particularly applicable to this type.

Packing.

The grenades are packed 12 in a wooden box, together with a cylinder containing 12 igniters.

Grenades, Hand, Nos. 6 & 7 or R.L. Grenade

(vii.) WEIGHT.

No. 6 or Light Grenade	-	1-lb.
No. 7 or Heavy Grenade	-	1-lb. 13-ozs.

DESCRIPTION. (*See* Plate 18, Figs. 3 and 4.)

The body consists of a tin cylinder with rounded ends 4" long and $2\frac{1}{4}$" diameter.

The heavy grenade contains an outer layer of scrap iron.

The igniter socket is closed by a wooden plug for transit, and covered by a papier maché cap.

The light Grenade contains explosive only. On one end of the cylinder there are two studs by means of which the lighter is fixed.

A cardboard tube runs down the centre of the grenade to take the lighter, fuze and detonator. When not in use a wooden plug is fitted into the end of this tube to keep out damp. A papier maché cap is also fitted on to the grenade. The grenades are always carried with this cap on (whether live or not).

The method of ignition consists of a friction igniter, a length of safety fuze and a service detonator, combined.

The friction igniter consists of the holder to which is fixed a flange with two notches and two springs. It also has two horns which form a grip for turning the igniter into the locked position. The friction bar is fixed to a button through which the firing becket passes.

INSTRUCTIONS.

To prepare for use.

1. Insert the igniter and clip the flange under the studs.
2. Replace papier maché cap.

To fire.

1. Hold the grenade in the right hand with the becket towards the wrist.
2. Remove papier maché cap.
3. Pull out the becket sharply with the left hand and throw at once.

Special precautions.

The grenades must always be carried with the papier maché cap on.

Packing.

The grenades are packed 40 in a box. The box also contains 4 haversacks. Igniters are packed in separate tins each containing 10.

Four of the remaining types of grenades are ignited by the Nobel fuze lighter attached to $1\frac{3}{4}$" service safety fuze and detonator No. 8 Mk. VII., described in para. (XV.)

Grenade, Hand, No. 8. or Double Cylinder Light Pattern Grenade.

(viii.) WEIGHT: 1lb. 6ozs.

DESCRIPTION. (*See* Plates 19 and 20.)

The body consists of a small tin cylinder $2\frac{3}{4}$" x $1\frac{1}{2}$" diam. filled with ammonal. This is placed inside a larger cylinder $3\frac{1}{4}$" x 3" diam. The space between the cylinders is filled with cast iron rings and shrapnel bullets. The top of the inner cylinder is closed by a tin plug containing a tube to take the detonator—two copper wires are soldered to this plug, in order to wire down the fuze.

Method of Ignition.

Nobel Lighter, $1\frac{3}{4}$" Safety fuze, Detonator No. 8 Mk. VII., (para. XV.)

Special precautions.

Fixing the lighter, fuze & detonator to the Grenade.

These are put together as described in para. (XV.); when inserting them into the grenade, the following points should be looked to.

1. The lip of the detonator should not project above the surface of the plug so as to avoid damage to the detonator.
2. The fuze and detonator should be well waxed round the joint where they enter the grenade.
3. The fuze should be wired to the grenade.

Grenade, Hand, No. 9. or Double cylinder heavy pattern grenade.

(ix.) WEIGHT: 2lbs.

This grenade is exactly similar to the No. 8 except that it has slightly more shrapnel and less explosive, which brings the weight up to 2lbs.

Grenade, Hand, No. 12 Hairbrush or Box Pattern Grenade.

(x.) WEIGHT: 3lbs.

DESCRIPTION. (*See* Plate 21, Figs. 1 and 2.)

The body consists of a tin box 3" x 5" x 2" filled with ammonal. A grooved cast iron plate $\frac{1}{4}$" forms the front side. In the end of the box there is a copper tube, to take No. 8 Mk. VII detonator. Two copper wires are soldered to the tin in order to tie down the safety fuze.

Handle.

Is similar to the back of an ordinary hairbrush.

Total length $13\frac{1}{2}$".

Grip 6".

The box is fixed to the handle by means of two iron straps which pass round the box and are secured by nuts at the back. A small wood block A is secured to the handle by screws. This carries the lighter, which is fixed to it by a steel strap B and screws. This block brings the lighter on a level with the hole for the detonator.

Method of Ignition.

Lighter. The lighter consists of a brass tube containing the following parts :—

(*a*) Spring and striker, the former being held normally under compression by a brass safety pin, which passes through the spindle of the striker.

(*b*) Cap and fuze. The striker on being released pierces the top of the cap which lights the fuze.

The fuze ($1\frac{3}{4}$" long) burns for 5 seconds and the flash then reaches the detonator and so explodes the grenade.

The following joints must be carefully waxed to render the tube damp proof and flash proof :—

(*a*) Between detonator and fuze.

(*b*) Between fuze and cap.

(*c*) Where tube enters body of grenade.

INSTRUCTIONS.

To fire.

(*a*) Hold the grenade in the right hand.

(*b*) Pull out the safety pin with the left hand.

(*c*) Throw at once.

Battye Grenade

(xi.) (*See* Plate 22, Figs. 1 and 2.)

WEIGHT 1lb. 2ozs.

Body.

A cast iron cylinder, 3" x 2" diam. with one end solid. The iron is grooved, so as to assist it in breaking up into sufficiently large fragments. The body is filled with about $1\frac{1}{2}$ ozs. of ammonal, guncotton, or other explosive. A wooden plug, pierced centrally to take the detonator, is fitted into the open end of the cylinder. This plug should be well waxed round the edge, and when not loaded a small wooden plug put in to take the place of the detonator, to keep out moisture.

Method of Ignition.

Instructions and Precautions as for Grenade Hand No. 8, para. (VIII).

Package of Grenades.

During transport the grenades are carried in wooden boxes holding 30, arranged with removable wooden partitions. These rest on the top of the grenades, and prevent the lid of the box from coming in contact with the end of the lighters.

Pitcher Hand Grenade.

(xii.) This grenade is very similar to the Battye Grenade. It differs in being slightly heavier and having a different lighter.

WEIGHT : $1\frac{1}{2}$lbs.

DESCRIPTION. (*See* Plate 23, Figs. 1 and 2.)

The body is a cast iron cylinder 4" x $1\frac{7}{8}$" diam. filled with explosive. One end is solid, and the other is closed by a tin plug.

This plug consists of :—

(*a*) a tube to take the fuze and detonator.

(*b*) a collar on the outside, made with 3 slots to take the 3 flanges on the lighter. The length of each slot is slightly longer than the corresponding flange, so that when the flanges have been pressed home, the extra lengths on the collar, marked "X" on the grenade itself can be pressed down, so as to prevent the flanges moving. This is done with the end of the crimping machine provided in each box of grenades.

Lighter.

This consists of a metal cup containing the friction tube. This cup has three small flanges on the outside which fit under the collar as already described. Inside the cup is the friction lighter with a small tube projecting below it, into which the safety fuze fits. A piece of thin cord 8" long is fixed to the lighter inside the cup. The other end of this cord is fixed to the inside of a metal cover, which fits on to the cup by means of a simple bayonet joint.

Before the fuze is fixed in the lighter, the small tube is kept closed by a tin cap, waxed on. This prevents any damp reaching the lighting composition.

To assemble.

1. Cut fuze to required length $1\frac{3}{4}$".
2. Remove small cap A.
3. Fit the fuze into the lighter at one end into a No. 8 detonator at the other, and crimp both these joints.

This should leave about $\frac{1}{4}$" of fuze exposed between the mouth of the detonator and the lighter. This must be covered with the rubber tape provided in each box of grenades.

INSTRUCTIONS.

To prepare for use

1. Insert the lighter, fuze and detonator and turn (right handed) till the flanges reach the ends of their respective slots.
2. Press down the parts of the collar marked "X," as already described. The lighter is then firm.

To fire.

1. Turn the cover to the left and pull it off.
2. Give the tape a sharp pull, thus igniting the friction tube (the cover and tape come away in the hand). *See* Special precaution (*b*) below.
3. Throw the grenade at once.

Special precautions.

(*a*) Unless the parts marked "X" on the grenade are pressed down, the whole lighter may come out, when it is only intended to remove the cover.

The grenade can be made safe by removing the detonator. This should only be done, with this type of grenade, by skilled men as it is difficult to take out the lighter after the parts "X" have been pressed down.

(*b*) The fuze *may* be lit without the tape coming apart from the grenade. For this reason, whether the tape comes apart or not, the grenade should be thrown as soon as the tape has been pulled.

Package of Grenades.

The grenades are packed in wooden boxes containing 23 grenades—23 lighters—25 detonators. A coil of safety fuze, some rubber tape, two crimping machines and a card of instructions are also provided.

Oval Grenade.

(xiii.) WEIGHT 1lb. 2ozs.

DESCRIPTION. (*See* Plate 24.)

The body is of $\frac{3}{16}$" cast iron, egg shaped, $3\frac{1}{2}$" long x $2\frac{1}{4}$" diameter at the middle—filled with ammonal.

It has a screw threaded hole at each end. One is filled by a solid steel plug, the other by a flanged brass plug bored centrally to which a hollow copper tube is fixed to take the detonator.

Method of Ignition.

A Brock Lighter is used consisting of a match-head and fuze combined, fitted into a No. 8 Mk. VII detonator. The lighter consists of a small cardboard cup filled with friction composition, covered with waterproof paper. The latter can be torn off by pulling a small tag which is left free. Time of burning 5 seconds.

The lighter is wired to the grenade and must be well waxed.

INSTRUCTIONS.

To fire.

1. Hold the grenade in the right hand.
2. Pull off the waterproof paper with the left hand.
3. Strike the lighter against the match composition and throw at once.

NOTE—With this type of lighter the man is provided with an armlet covered with match composition.

Special precautions.

The paper must not be removed from the cap except before throwing, as the composition will get damp, or the grenade may be accidentally lighted.

Ball Grenade

(xiv.) WEIGHT of grenade complete 1lb. 6ozs.
„ „ ammonal - - 5½ozs.

DESCRIPTION. (*See* Plate 25.)

The body is a cast iron sphere 3" in diameter, filled with ammonal, and closed by a screwed steel plug 1⅜" diam. This plug carries a copper tube to take the detonator into the centre of the grenade.

There are two holes in the top of the plug to take a key for the plug which is screwed down flush.

Two copper wires, for tying down the fuze, are attached to a small stud on the plug.

Lighter, fuze and detonator; as for No. 8 and 9 Grenades, or Brock Lighter.
Instructions for throwing. „ „ „

The precautions to be taken are also the same as for Nos. 8 and 9 with the addition of waxing round the plug.

Nobel Lighter.

(xv.) DESCRIPTION.

The lighter is made up of two cardboard tubes, one fitting over the other. Inside the end of the outer tube, there is a small brass cap containing friction composition. This can be lighted by a forked brass striker fixed to the end of the inner tube. In the normal safety position the striker is ¼" from the cap, and is held in position by a safety pin, passing through both tubes. Inside the other end of the inner tube, there is a small copper band into which the fuze is fitted. The latter is secured by crimping the copper band.

To prevent moisture reaching the cap a narrow tape band with a loose end is glued to the inner tube at the joint between the two.

The lighter, fuze and detonator are assembled as follows:—

1. The length of fuze (1¾") is put into the lighter as described. This leaves about ⅞" fuze exposed. This end is then put into the detonator—the joint between fuze and lighter being waxed and crimped to render it damp proof and flashproof.
2. The joint where the fuze enters the body of the grenade must also be waxed.

INSTRUCTIONS FOR FIRING (when fixed to a grenade).

1. Hold the grenade in the right hand gripping the bottom of the inner tube between thumb and forefinger.
2. Tear off the tape and pull out safety pin.
3. Press down the outer tube with the left hand and turn it slightly—thus scratching the points against the composition. This action produces a flash which passes down the tube and lights the fuze.
4. Throw the grenade at once.

Time of burning 5 seconds.

Appendix 4.

DESCRIPTION OF GERMAN GRENADES

AND

INSTRUCTIONS FOR THEIR USE.

(i.) German hand grenades which have been found are of two types: those which have the appearance of Service articles and those which are obviously improvised. With the latter, great care is invariably taken to protect the charge from damp, and to render it flashproof by waxing, etc.

Grenades are ignited either by time or percussion. With the former, the time of burning is about 6 seconds, and the fuze is ignited by one of the following methods :—

(*a*) Spring striker and cap.
(*b*) Friction tube.
(*c*) Match-head lighter.

} Attached to fuze and detonator.

(ii.) The following precautions should be taken with any grenades that may be found or captured :—

1. The grenades should be examined at once by a grenadier, in order to find out whether they are live, how they are fired, etc.
2. The means of firing will probably be immediately apparent to a trained grenadier, but, during examination, grenades should be handled with care.
3. No man who does not understand grenades should touch them, but should report the presence of a store of grenades, to the nearest grenadier, N.C.O., or Officer.
4. If being used against the enemy, a grenade should be thrown as soon as it is "lit," even if there is no apparent evidence of the fuze burning.
5. Arrangements for removing, storing or destroying grenades found in a captured position should be made as soon as possible by Grenadier Officers.
6. Grenadier Officers will also be responsible that when samples of grenades are taken back to Headquarters for examination, the grenades are not in a dangerous condition, and have the detonators removed.

Spherical Grenade

(iii.) WEIGHT: 1 lb. 10 ozs. Can be thrown about 30 yards.

DESCRIPTION. (*See* Plate 26, Figs. 1 & 2.)

The body is spherical, about 3" in diameter, made of cast iron about $\frac{1}{3}$" thick, and is filled with black powder or other explosive which does not require a detonator. The body is coated with varnish inside and out.

Method of Ignition.

Combination of friction tube, lighter and fuze. The friction tube is fired by pulling out the wire in the direction of the axis of the tube (see Plan F, fig. 3). A wrist strap, with a swivel hook, is usually provided for this purpose. Time of burning 7 seconds. A similar lighter which burns for 5 seconds is also provided. It is distinguishable by the head of the fuze being painted red.

Safety Arrangements.

1. Grenade and fuze kept separate during carriage.
2. The vent for the fuze in the grenade is closed by means of a zinc plug.
3. The holes, A and B (*see* Fig. 2), in the lighter are covered with waterproof paper.
4. The wire is bent in order to avoid a direct pull.

INSTRUCTIONS.

To prepare for use:

1. Take the lighter, remove the oiled paper from A and B and straighten the wire, taking care not to pull it.
2. Insert the lighter.
3. Put on the wrist strap.
4. Hold the grenade in the right hand, with the igniter towards the wrist.
5. Hook the swivel at the end of the strap on to the wire pull of the grenade.
6. Throw the grenade.

Note.—If a strap is not provided, a nail, or a loop of string, should be passed through the wire pull.

Grenade with Spring Igniter charged with missiles, etc

(iv.) WEIGHT: $2\frac{1}{2}$ lbs.

DESCRIPTION. (*See* Plate 27, Figs. 1 and 2.)

The body consists of a cylindrical tin of explosive, 2" diameter, placed in a tin 3" diameter, the space between being filled with nails, scrap-iron, etc. The bottom is closed by a wooden plug in which a small hole is bored for the detonator.

The handle is of wood, $8\frac{3}{4}$" long, the head of which forms the wooden base plug. To secure the body to the handle, the edge of the outer cylinder of the body is turned down over the base plug.

Method of Ignition.

Consists of a spring, striker and cap, encased in brass tube, fastened to the handle by a steel band. Fuze and detonator are attached in the usual way.

The spring is compressed by a collar at the end of the striker rod. The rod is held back by a safety pin passing through it at the end of the case. As soon as the pin is released, the striker flies forward and fires the cap, thus lighting the fuze.

Fuze about 2" long. Time of burning 6 seconds.

INSTRUCTIONS.

(*a*) To prepare for use.

1. Hold the grenade in the right hand.
2. Withdraw the safety pin.
3. Throw at once.

(*b*) To render useless.

1. Remove the handle and base plug by raising the turned down edge of the cylinder. This must be done very carefully.
2. Empty the contents of the body.

Small Tin Grenade.

(v.) WEIGHT: 12 ozs.

DESCRIPTION. (*See* Plate 27, Figs. 3 & 4.)

The body is a tin case $4\frac{7}{8}$" x $1\frac{1}{16}$ x $1\frac{1}{16}$, filled with explosive.

Method of Ignition.

Combined match-head igniter, fuze and detonator. (*See* Fig. 3.)

The match-head igniter consists of a small lead tube closed at one end with a ball of red phosphorus, varnished, and covered with oiled paper.

A piece of safety fuze is pushed home and secured in position by crimping the tube round it; the detonator is fixed to the other end of the fuze in a similar manner.

Safety Arrangements.

1. The grenade and igniter are kept separate during carriage, and a wooden plug is put into the grenade in place of the detonator.
2. The phosphorus head is protected from friction and damp by waterproof paper.

INSTRUCTIONS.

To prepare for use.

Take out the wooden plug, if necessary use the rectifier, and insert the igniter. (This is kept in place by the lead tube fitting tightly into its seating; the joint should be waxed.)

Tear off the paper cover from the lighter.

Hold the grenade in the right hand, rub the match-head with some rough material (side of match-box, etc.); a wind-match or pocket lighter may be used instead.

Throw immediately.

Time of burning: 6 seconds.

To render useless.

Take out igniter and fill up hole with mud, etc.

Cylindrical Grenade with Friction Tube, Regulation Type.

(vi.) WEIGHT: 2½lbs.

DESCRIPTION. (*See* Plate 28, Figs. 1 & 2.)

The body consists of a tin cylinder 4" x 2⅞" diameter which contains a cartridge of explosive. This is closed at the top with a lid held in place by four clips: at the bottom there is a screw-threaded hole to take the handle. The bottom of the cartridge is fitted with a paper tube for the detonator. On the side of the body there is a hook, by means of which the grenade can be attached to the belt.

The inscription on the body "Vor Gebrauch Sprengkapsel Einsetzen" means "before use insert the detonator."

Handle: Wooden, 9⅞" long, has a screw-threaded metal top which fits into the body. It is bored out axially to take the igniter and wire pull.

Method of Ignition.

Consists of a friction lighter and safety fuze contained in a cardboard tube. The igniter is actuated by pulling a string loop at the end of the handle. This loop is attached to the wire pull of the friction tube, and is fixed to the handle by means of a paper band. The mouth of the detonator fits into a brass tube at the top of the igniter, and is fired by the flash from a dab of phosphorus at the end of the safety fuze. Time of burning 5½ or 7 seconds as marked on the handle.

Safety Arrangements.

1. The grenade and detonator are kept separate during carriage.
2. The drawing loop is attached to the handle by a paper band, which must only be removed before firing.

INSTRUCTIONS.

To prepare for use.

1. Unscrew the handle and see if the detonator is in position; if it is, refix the handle.
2. Hold the grenade in the right hand.
3. Tear off the paper band with left hand.
4. Pull loop with left hand.
5. Throw immediately.

If the detonator is not in position, search should be made for a supply of the proper detonators. Fit the mouth of the detonator into the projecting brass tube, screw in the handle and then proceed as in 2, 3, 4, and 5 above.

To render useless.

1. Unscrew handle, remove detonator.
2. Pull drawing loop and throw handle away.

Hairbrush Grenade with Spring Igniter.

(vii.) WEIGHT: 2½ lbs.

DESCRIPTION. (*See* Plate 29, Figs. 1 and 2.)

The body consists of a tin box 2¾" x 2¾" x 6" filled with explosive. This box is nailed on to a wooden handle. Length complete is 15".

Method of Ignition.

Spring igniter, fuze and detonator, similar to that used in the cylindrical grenade, with spring igniter.

The igniter is kept in position by means of a zinc band screwed on to the handle.

Safety Arrangements and Instructions.

As for cylindrical grenade with spring igniter (*see* para. vi.), except that the safest way to destroy this grenade is to fire it in a pit or disused trench.

Disc Hand Grenade (Percussion)

(viii.) WEIGHT: about 1lb.

DESCRIPTION. (*See* Plate 31, Figs. 2 and 3.)

The body consists of the two iron shells convex on the outside and with the edges either turned over or rivetted. It contains two circular bags of explosive, each containing 2 ozs.

Method of Ignition.

Consists of six metal tubes in the shape of a star, meeting at the centre of the grenade plug. Four of these tubes carry striker pellets and caps, and opposite to each cap is one of the four points of a cross. The outer end of each of these tubes is closed by a screwed plug. One of the remaining two tubes carries the detonator of which the inner end is open. This tube is closed by a screwed plug with milled head with the letter "S" on it.

Safety Arrangements.

The sixth tube contains a safety pellet divided into two prongs, one of which passes on each side of the cross and protects the points. This pellet is retained in its position by a cap which closes the outer end of this tube. This cap is secured to the tube either by clips, or by a safety pin with ring.

INSTRUCTIONS:

(*a*) To prepare or use.

1. Hold the grenade in the right hand, safety pin upwards.
2. Pull out the safety pin with the left hand.
3. Pull off the cap and hold the safety pellet in position with the right forefinger (if necessary the safety pin can be replaced).
4. Throw the grenade as high as possible, taking care that the edge is vertical.

Note.—These grenades can also be thrown with the strap provided in each box, but this requires considerable practice.

(*b*) **To render useless.**

1. Unscrew the plug of the tube, marked "S," opposite to the safety pin.
2. Remove detonator.

Action during Flight.

Owing to the grenade turning over, the safety pellet flies out and the grenade becomes sensitive. When the edge of the grenade strikes the target the corresponding striker pellet drives the cap forward on to the point of the cross. The flash passes into the detonator and explodes the charge. A low or horizontal throw may cause a failure. On detonation the fragments fly out laterally, and not to the front or rear.

Parachute Grenade (Percussion).

(ix.) DESCRIPTION. (*See* Plate 32.)

The body, which is painted black, consists of a tin cylinder of explosive with hemispherical head of larger diameter containing shrapnel bullets. A buffer cylinder passes through the body and projects, so as to produce the explosion slightly above ground. The base of the body is closed by a wooden plug at the handle. A parachute safety arrangement is attached to the head of the handle in order to prevent fragments flying to the rear on explosion and also to cause the grenade to fall on its head.

Method of Ignition consists of :—

1. The detonator in the buffer cylinder supported by the screwed plug at the end.
2. The percussion pellet with point and spiral spring.

Safety Arrangements consist of the following :—

1. A cord 7 metres long which normally is coiled up inside the handle, is attached to a long needle passing down the percussion pellet. A safety hook retains a ring attached to the end of the percussion pellet and the needle passes through a hole in this hook. After the first 7 metres of the flight, the jerk on the cord pulls out the needle, and the safety hook is thus free to fall out sideways and so allow the percussion pellet to move forward on concussion.
2. Keep pin and creep spring. The former prevents the percussion pellet from falling back.

INSTRUCTIONS.

(*a*) **To Prepare for use.**

1. Unscrew the plug in the head.
2. Place in the detonator, fulminate downwards.
3. Screw in the plug.
4. Tear off the band holding the parachute.
5. Holding the loop of the cord firmly with the first and second fingers of the right hand, take out the plug from the handle unwinding as short a length as possible of the cord.

6. Hold the grenade in the right hand.
7. Retaining the loop of the cord, throw the grenade so that it will reach a height of 12 or 13 feet.

(*b*) To render Useless.

Remove the detonator.

NOTE.—The grenades may be found "live," in which case 1, 2 and 3 have already been done.

This grenade can be used in attack or defence, but it is particularly designed for the former, as the fragments are projected in a forward direction only, and so are not dangerous to the throwers. The safety arrangements prevent the grenade from becoming dangerous, until it has flown about 7 metres.

Rifle Grenade 1913 Percussion

(x.) WEIGHT: about 2 lbs. complete. Charge 3.2 oz. explosive.

DESCRIPTION. (*See* Plate 30, Fig. 1.)

The body of steel (12 cm. long and 4 mm. thick) is serrated longitudinally and transversely, so that on detonation it may split up into fragments of sufficient size. It is painted grey. The base is closed by a brass base cup, which has screwed into it a steel tail rod 18" long, with copper gas check to take the grooves of the rifling. The rod has a thin coating of copper to protect it from rust, and also to protect the barrel. A tin disc is fastened to the head of grenade by igniter plug for short ranges.

Method of Ignition.

Consists of an igniter plug, carrying cap and detonator, which is screwed into the head of the grenade. A brass tube passing through the centre of the grenade contains a striker pellet, with needle and creep spring.

Safety Arrangements.

1. Powder safety arrangements contained in base cup. Screwed into the striker pellet is a spindle, which passes through into the base cup, and has at its lower end a small platform with three flash-holes. On this rests a pellet of compressed powder, the object of which is to keep the striker from moving forward until a short time after the grenade has left the rifle. This powder is ignited by means of a small brass pellet with a cap, which sets back on the shock of discharge, and, flattening a small spring, is penetrated by a needle on the screw plug closing the base cup. A vent hole in the base cup allows the escape of the gases of combustion. This is normally sealed with wax.

2. The powder, having burnt away, the striker is only prevented from moving forward by a creep spring, the resistance of which is overcome on concussion.

INSTRUCTIONS.

(*a*) To Use.

1. Screw in the igniter plug (with tin disc for ranges under 200 yards).
2. Lower the grenade carefully into the barrel.
3. Insert a rifle grenade cartridge in the breach.
4. Fix the rifle at the required elevation.
5. Fire the rifle.

(*b*) **To render useless:** Unscrew the igniter plug in the head of the grenade

Precautions.

1. A German rifle only can be used.
2. Care must be taken that the Grenade is not dropped, especially if falling on the tail rod, as then it is liable to become "live," and will therefore detonate on firing.
3. The special rifle grenade cartridge should be used, and in no case a ball cartridge.
4. Tail rods which jamb or rub when being placed in the barrel must not be used, and no force is to be employed.
5. Damp tail rods should be dried before use. All rods should be firmly screwed in.

Rifle Grenade, 1914. (Percussion).

(xi.) WEIGHT: about 2lbs.

DESCRIPTION. (*See* Plate 30, Figs. 2 & 3, and Plate 31, Fig. 1.)

The body is of cast iron 5 mm. thick and contains the charge ($2\frac{3}{4}$ ozs.) made up in a thin cardboard cylinder, which is retained in the grenade by a shoulder piece screwing on to the body. The nose of the grenade is screw threaded to take the percussion fuze, and the base to take a nipple for a tin disc and tail rod with gas check. Up to the time of fuzing it is protected from dust and damp by a plug and leather washer. The body, which is painted field grey, is serrated to give fragments of sufficient size on detonation.

Method of Ignition.

The percussion fuze contains an exploding charge with detonator and cap. The last named is set off by a striker pellet, the needle of which lies flat on top of the cap when in the safety position. The striker and spring are contained in a percussion pellet screwed into the socket of the fuze.

Safety Arrangements.

1. The percussion pellet is retained in position by a locking ball (*see* Plan H, Fig. 14) which rests in a groove in the socket and percussion pellet. This ball cannot fall out owing to a locking ring which is held up by a flat spring with curved ends. On the rifle being fired the locking ring sets back overcoming the spring, and the locking ball is driven out of its groove by the percussion pellet which acting under the pressure of its spring, moves forward together with the nose of the fuze out of the body. At the same time the needle pellet, owing to its spring, pulls up the needle into the firing position.
2. The spring of the percussion pellet prevents any tendency to be driven back into the cap until striking the target.

INSTRUCTIONS.

(*a*) **To use.** As for Rifle Grenade 1913.

(*b*) **To render useless.** Unscrew fuze from grenade.

Precautions. As for Rifle Grenade 1913.

The live grenade can be easily recognised, as the nose of the fuze will be either entirely or partially out of the body.

The live grenade is most sensitive.

Appendix 5.

DESCRIPTION OF FRENCH GRENADES
AND
INSTRUCTIONS FOR THEIR USE.

(i.) The following grenades are in general use by the French Army :—

1. Ball or " Fortress Artillery " Grenade
2. Hairbrush Grenade—with box body. } " Petards."
3. " " —with jam tin body. }
4. Pear-shaped Grenade (percussion).
5. Besozzi Grenade.

The general precautions laid down in the " Description of British Grenades " apply equally to these grenades, and only the special precautions applicable to each grenade will be given.

Ball Grenade.

(ii.) WEIGHT: 2 lbs. 9 ozs. Charge 4 ozs.

DESCRIPTION. (*See* Plate 36, Fig. 1.)

The body is a hollow cast iron sphere $3\frac{3}{16}$" diameter, filled with black powder. Walls, $\frac{3}{8}$" thick. A loading hole $\frac{3}{4}$" diameter is left in the body, and is closed by a wooden plug, which takes the fuze.

Method of Ignition.

Consists of a strong friction tube with wire pull let into a wooden fuze. Time of burning 5 seconds.

Strap for Throwing. (*See* Plate 36, Fig. 2.)

A Leather wrist strap, attached to which are 8" of cord ending in a swivel hook.

Safety Arrangements.

1. The fuzes are stored separate from the grenades.
2. The plug is covered with paper.
3. The wire pull is bent downwards so as to prevent a direct pull on fuze.

INSTRUCTIONS.

1. Place the leather strap round the right wrist.
2. Tear off the paper from the plug as far as the surface of the grenade.
3. Bend up the wire pull in the direction of the axis of the fuze.
4. Attach the swivel hook to the ring on the wire.
5. Hold the grenade in the right hand, with the fuze towards the rear.
6. Throw the grenade, with the arm fully stretched out, and do not bring back the arm until the wire is pulled.

Precautions.

1. Care should be taken to avoid a direct pull when bending the wire into the firing position.
2. *Vide* Instructions No. 6 above.

Hairbrush Grenade with box body.

(iii.) WEIGHT 1lb. 12 ozs.

DESCRIPTION. (*See* Plate 33, Figs. 1 & 2.)

The body consists of a tin box, $4\frac{1}{4}$" x $2\frac{1}{2}$" x $2\frac{1}{2}$", filled with 4 cartridges of cheddite. This box is cut out of a sheet of tin as shown in fig. 1. The sheet is then bent into the form of a box, and nailed to the handle, which forms the bottom of the box. The strips marked "x" in the diagram are then bent over into the positions "y" and those marked "z" are bent round the edges of the handle. All joints are then well luted.

The handle is of wood, 14" long, total length of grenade $18\frac{1}{4}$". Width at head $2\frac{1}{2}$". A flat strip of zinc is nailed to the back of the handle. This can be bent over to form a hook (for attachment to belt, etc.). It is left flat to facilitate package.

Means of Ignition.

The grenade is fired by means of a friction igniter, safety fuze and detonator.

The igniter consists of a copper tube, 3" long, covered with blue paper. It is fired by pulling a ring at the end of a wire passing into the composition in the friction tube. Fuze 8 cm. long. Time of burning 7 seconds. Joints are crimped and covered with luting when in position.

The igniter is nailed to the handle by means of a narrow tin strap. A staple passes over the wire at the end of the tube, and acts as a stop for the igniter when the wire is pulled.

Safety Arrangements.

A paper band passes over the ring at the end of the wire, and is secured by a nail which passes through the middle of the ring.

INSTRUCTIONS.

1. Hold the handle in the right hand.
2. Tear off the paper strip with the left hand, and pull the wire.
3. Throw immediately.

Special Precautions.

1. Owing to the fact that this grenade is hand-made, particular attention must be paid to the luting of the joints.
2. As the grenade is invariably carried "live," it should be handled carefully.

Hairbrush Grenade (with jam tin body).

(iv.) WEIGHT : 2 lbs.

DESCRIPTION. (*See* Plate 34, Fig. 1.)

The body consists of a circular jam-tin, height 3", diameter $3\frac{1}{2}$", containing $12\frac{1}{2}$ oz. cheddite. The lid for this can be made either from a second jam tin, or from a circular piece of tin with the edges bent over.

The handle is of wood, 18" long, similar to that of Box Hairbrush Grenade, except for the head, which is shaped to take the jam-tin.

Method of Fixing Body to Handle. (*See* Plate 34, Fig. 2.)

1. Twist up two wires 18" long.
2. Drive four $1\frac{1}{2}$" nails through the handle and place the wire between them.
3. Make a hole in the side of the tin for the detonator, about $\frac{3}{4}$" from the base.
4. Place the base of the tin on to the points of the four nails until it is in contact with handle.
5. Bend over the points of the nails to secure the tin.
6. Fill the tin with explosive.
7. Put on the lid, and fasten it down by twisting together the four ends of the wires. These wires should be tightened by making bends at the sides with a pair of pliers.
8. All joints, including those round the igniter and detonator, should be well luted.

Method of Ignition.
Safety Arrangements.
Instructions.
Precautions.

As for Hairbrush Grenade with box body.

Pear-shaped Grenade (Percussion).

(v.) WEIGHT : 1lb. 3ozs.

DESCRIPTION. (*See* Plate 35, Figs. 1 & 2.)

The body is made of iron, cast to the shape of a pear, with a hole at each end. Length $3\frac{1}{2}$"—maximum diameter 2". It is grooved on inside to assist fragmentation, and contains about 1 oz. explosive.

The hole in the base, through which the explosive is loaded, is closed by a screwed lead plug. The hole in the neck is closed by a steel plug, which carries a copper tube to take the striker, creep spring and detonator.

Method of Ignition and Percussion Mechanism.

An aluminium lever fits against the side of the body, and is normally secured in position by means of a string, which passes round the body and is fastened by a metal seal.

A streamer, 18" long, with a small metal steadying plate at the end, is attached to the lever and is normally folded under it. At the narrow end of the lever are two cams, between which the striker is fixed by means of a pin passing through them. On this pin, there is a spiral spring, which actuates the lever.

The object of the cams, which bear against the neck of the grenade, is to hold back the striker until the grenade has left the hand.

The striker consists of a steel rod, one end of which carries the needle point. The other end is divided and a pin passes through it and the steel plug. Thus the striker is prevented from coming out of the grenade, but is free to move forward against the creep spring as soon as the lever is released.

Action.

As soon as the grenade has left the hand, the lever flies up. As the broad part of the cams on the lever no longer bear on the neck of the grenade, the striker is now free, and is only held back by the creep spring.

The grenade is made to fall on its head by means of its shape and the streamer. When it reaches the ground, the striker, owing to its inertia, compresses the spring sufficiently to pierce the detonator and thus fire the grenade.

Safety Arrangements.

1. The cams on the lever prevent any movement of the striker until the grenade has left the hand.
2. The lever is prevented from moving by the string tied round the body.

INSTRUCTIONS.

1. Hold the grenade in the right hand, with the neck of the grenade towards the wrist and the lever against the palm of the hand, leaving the metal seal exposed.
2. Twist off the seal with the left hand.
3. Throw the grenade.

Precautions.

As the grenades are always live, they should not be tampered with in any way.

Package.

The grenades are packed in boxes of 50, ready for use. Each is protected by a roll of corrugated cardboard, and it is usually advisable to leave this on until immediately before use.

Besozzi Grenade.

(vi.) WEIGHT: 1lb. 7 ozs.

DESCRIPTION. (*See* Plate 37.)

The body is made of serrated cast iron. A hole is left at one end, through which the explosive is loaded. It is closed by a plug through which the fuze passes.

Method of Ignition.

Consists of a detonator and time fuze tipped with red phosphorus. The fuze projects about 2" from the grenade. This projecting end is bent over and waxed on to the body. A striking box or ring is also provided.

Safety Arrangements.

1. The grenade is packed in waterproof paper.
2. The joint round the plug is well luted.

INSTRUCTIONS. (*See* Plate 38.)

1. Hold the grenade, fuze upwards, in the right hand.
2. Hold the striking box, or ring, in the left hand.
3. Strike the phosphorus tip with a downward motion of the left hand.
4. Throw immediately.

Time of burning: 5 seconds.

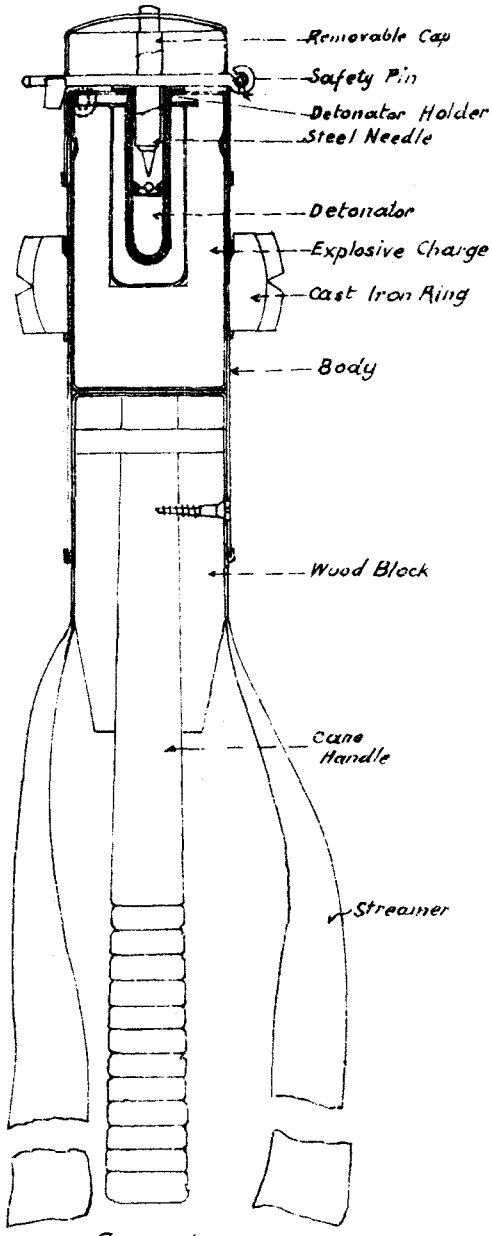
Precautions.

1. The grenade must be struck with a downward motion, otherwise the fuze may be dragged away from the body, and fail to ignite.

N.B. The grenade is carried live.

GRENADE, HAND, No.1.

Plate 16.



SCALE 1/2.

Plate 17.

GRENADE, HAND No 2.

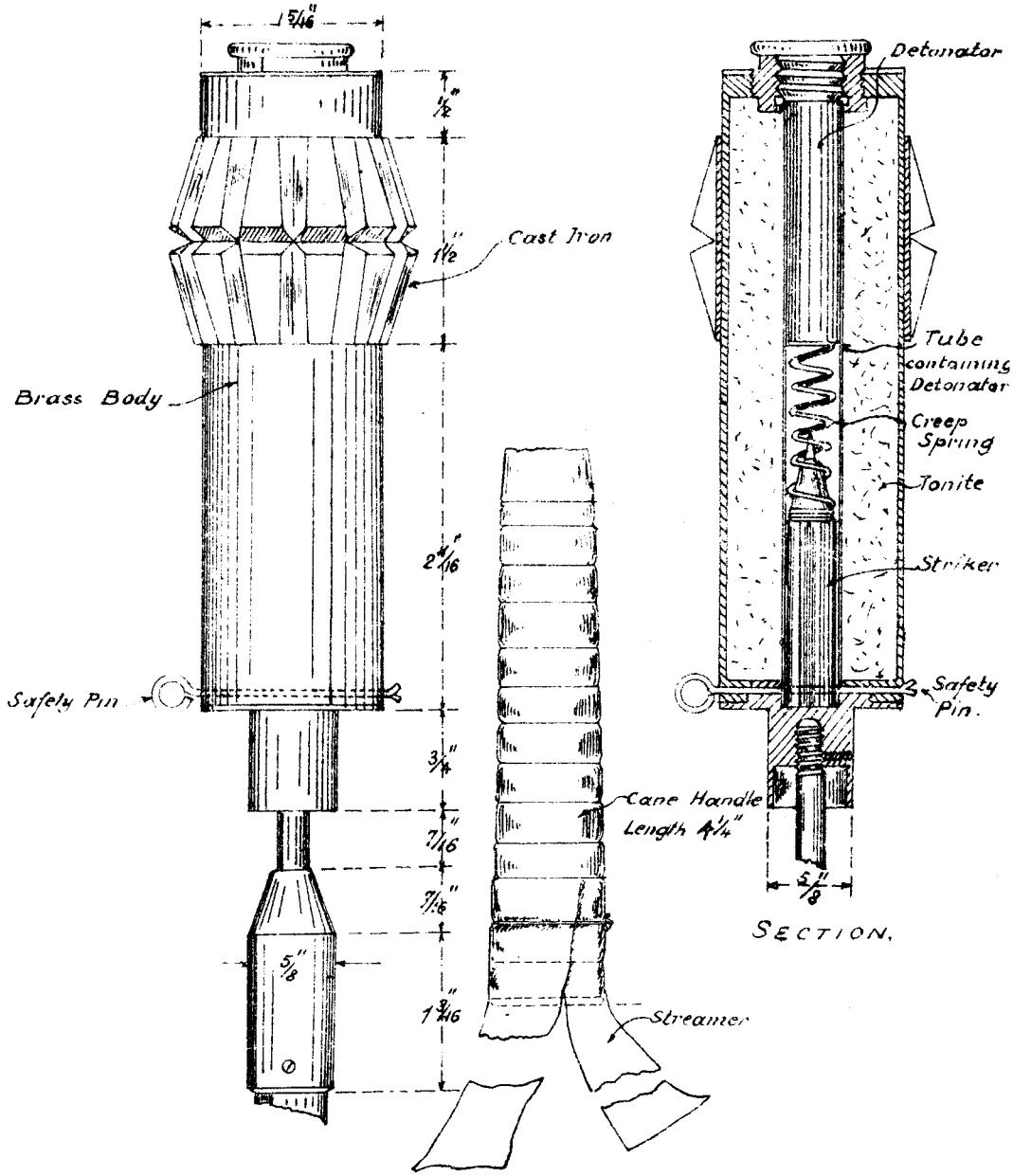
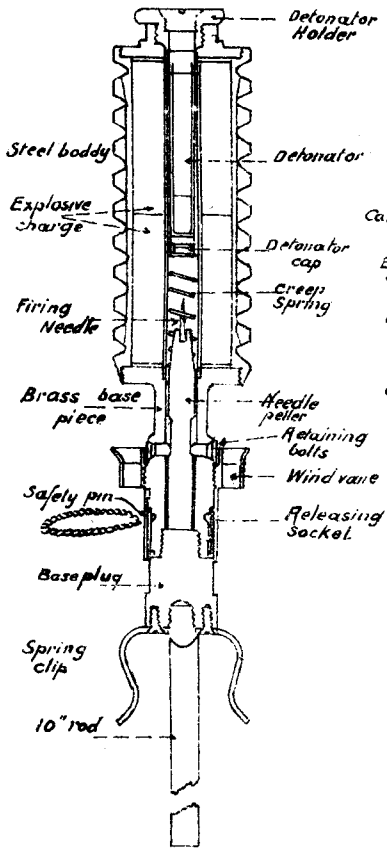


Plate 18.

GRENADE .303" short rifle. No3.

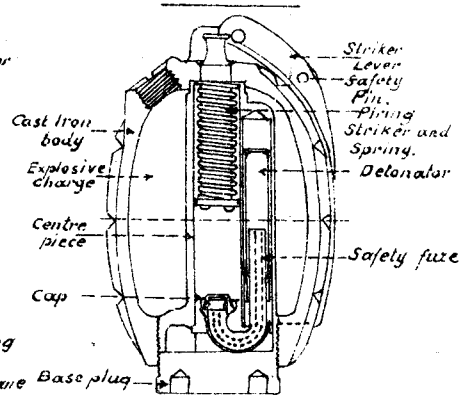
Fig. 1.



SCALE 1/3

GRENADE. HAND. No5.

Fig. 2.

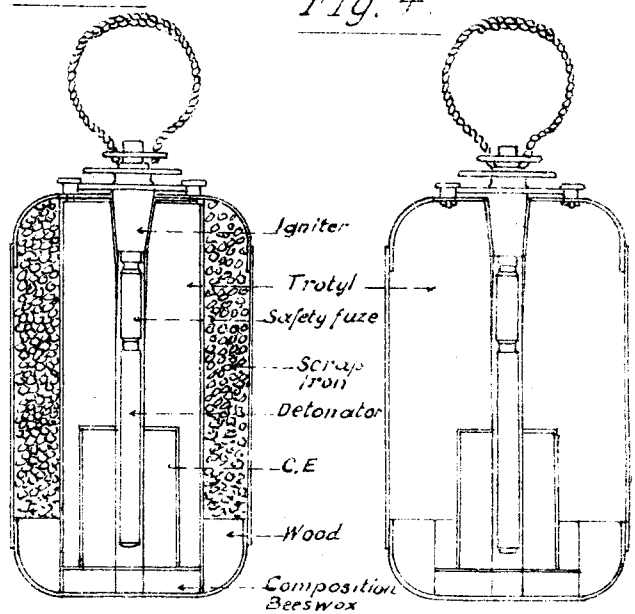


SCALE 1/2

GRENADE. HAND. Nos 6, and 7

Fig. 3.

Fig. 4.

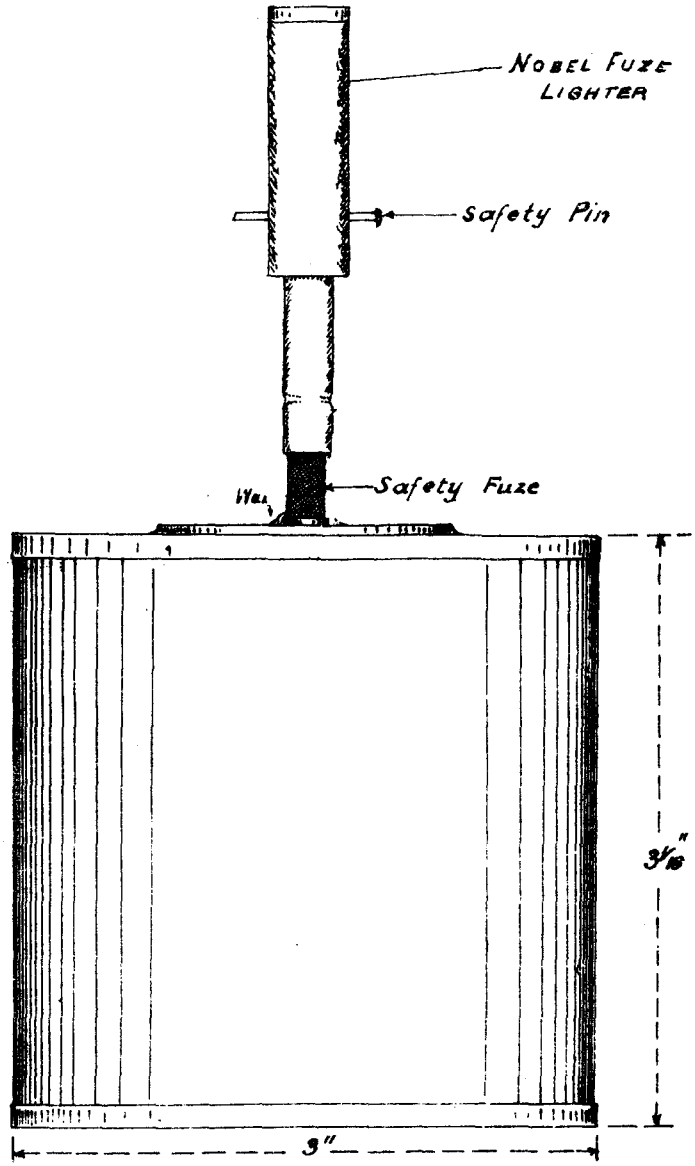


SCALE 1/2.

(511)

Plate 19.

GRENADE, HAND. No8

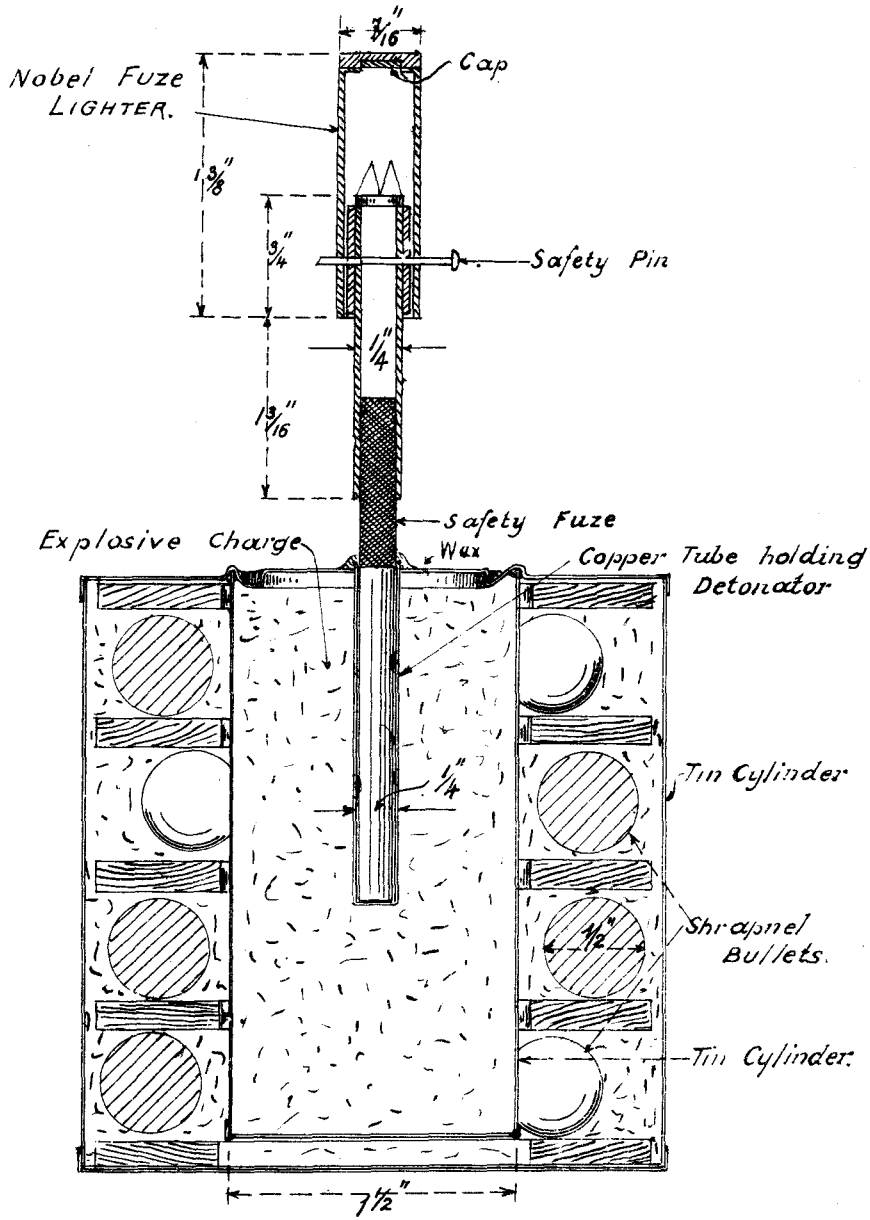


ELEVATION

FULL SIZE.

GRENADE, HAND. No 8.

Plate 20.



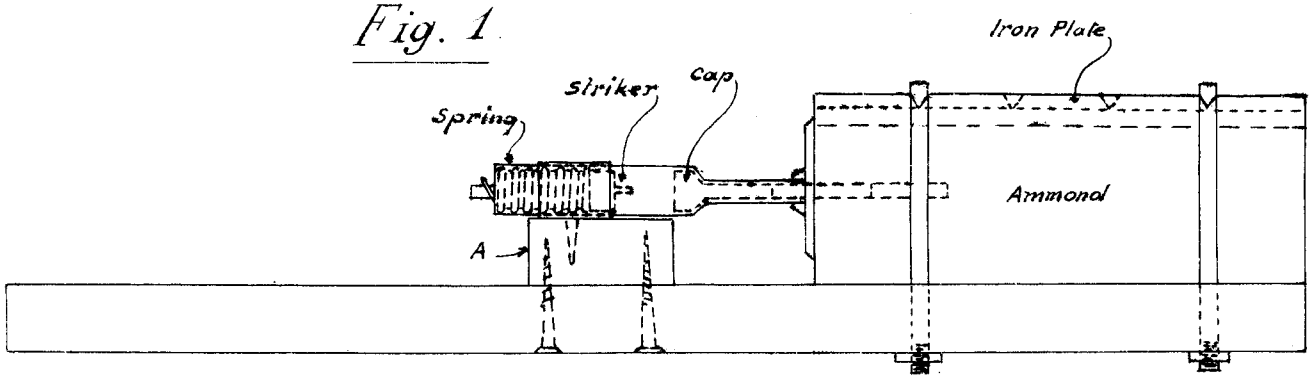
SECTION

FULL SIZE.

Plate 21.

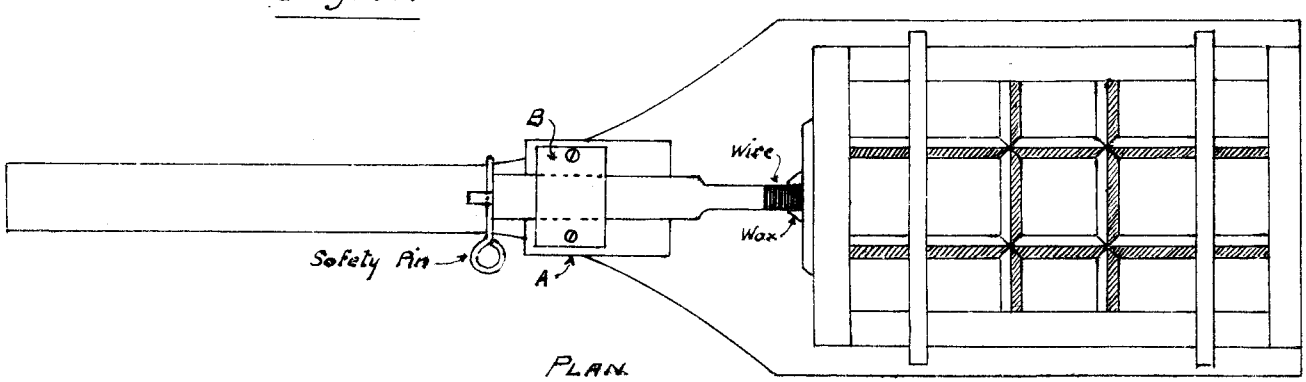
GRENADE, HAND. No 12.

Fig. 1.



ELEVATION.

Fig. 2.



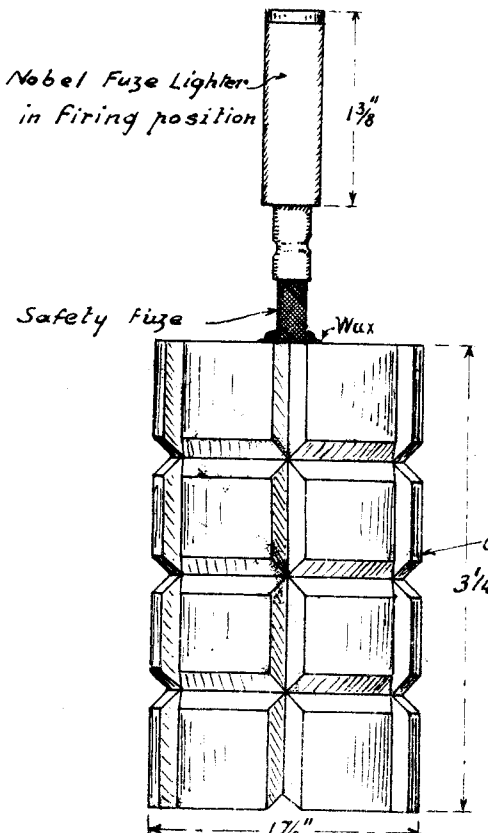
PLAN.

SCALE ½.

BATTYE HAND GRENADE

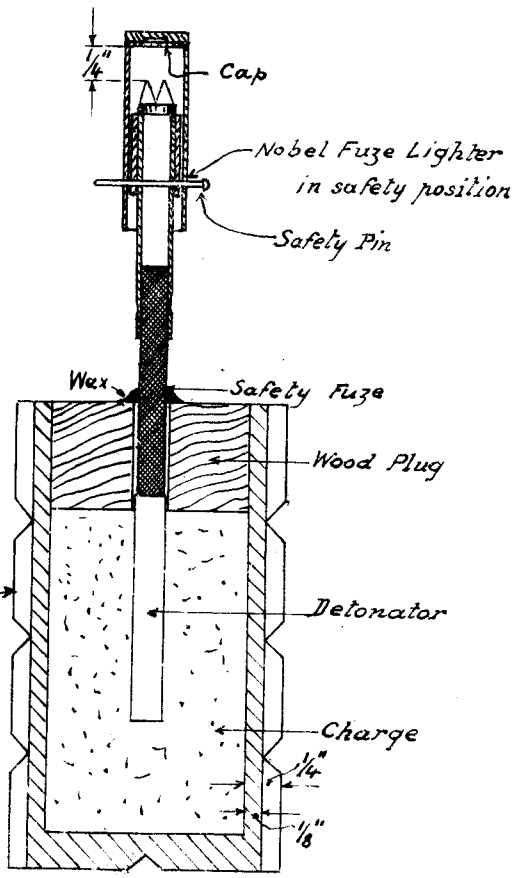
Plate 22.

Fig. 1.



ELEVATION

Fig. 2.



SECTION.

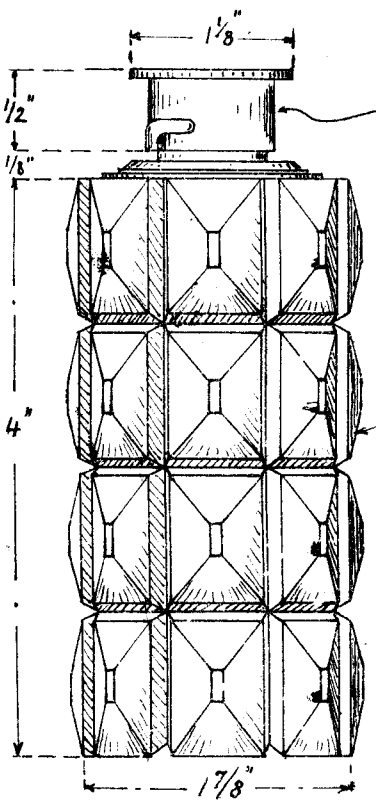
SCALE 3/4

(55)

PITCHER HAND GRENADE.

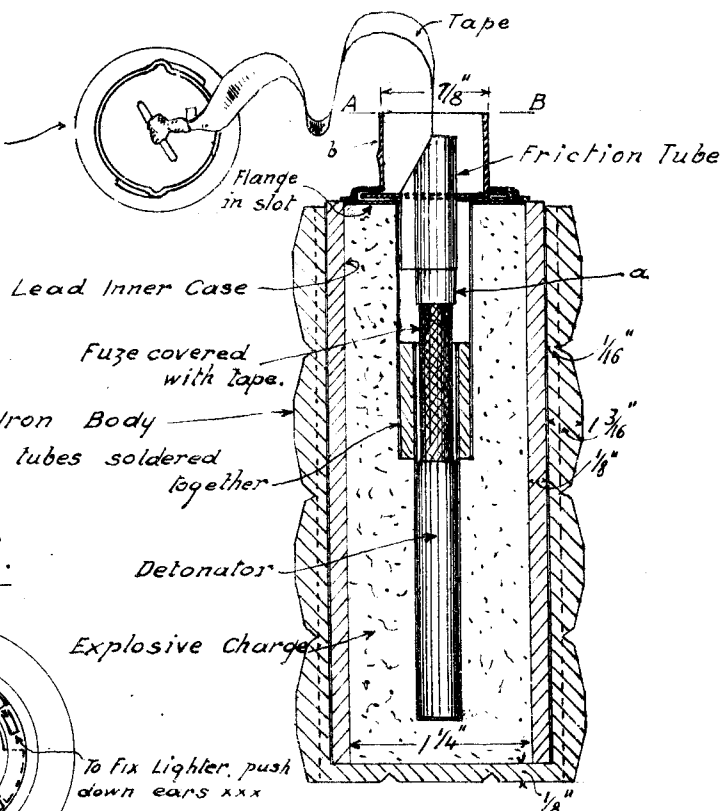
Plate 23.

Fig. 1.



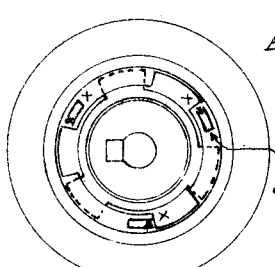
ELEVATION

Fig. 2



SECTION.

Fig. 3.



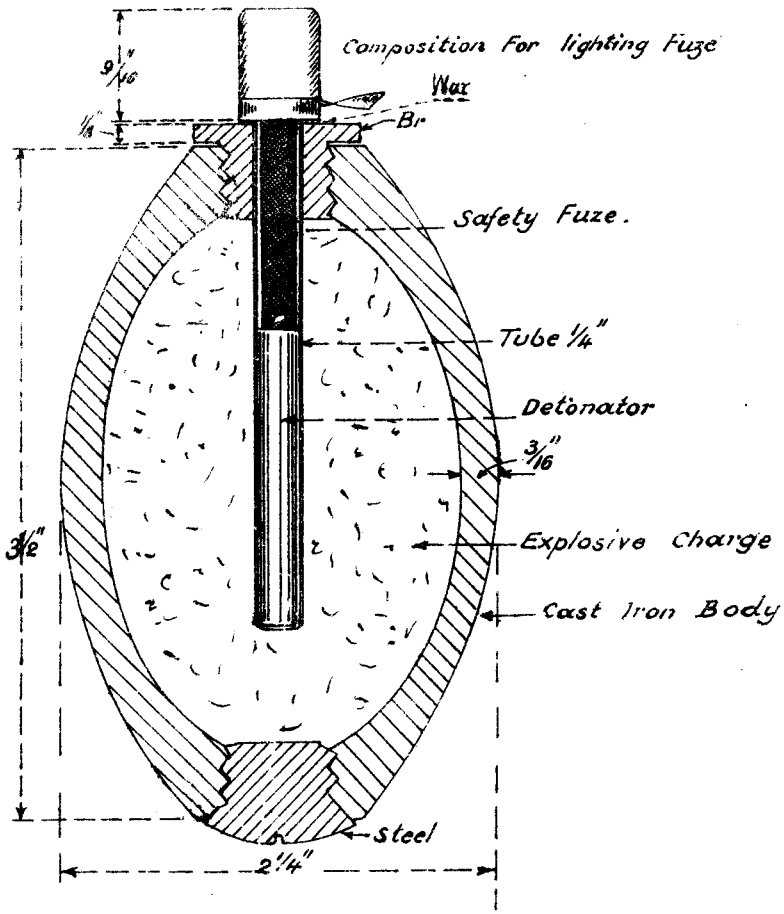
PLAN ON AB.

SCALE. ¾.

(56)

Plate 24.

OVAL HAND GRENADE.

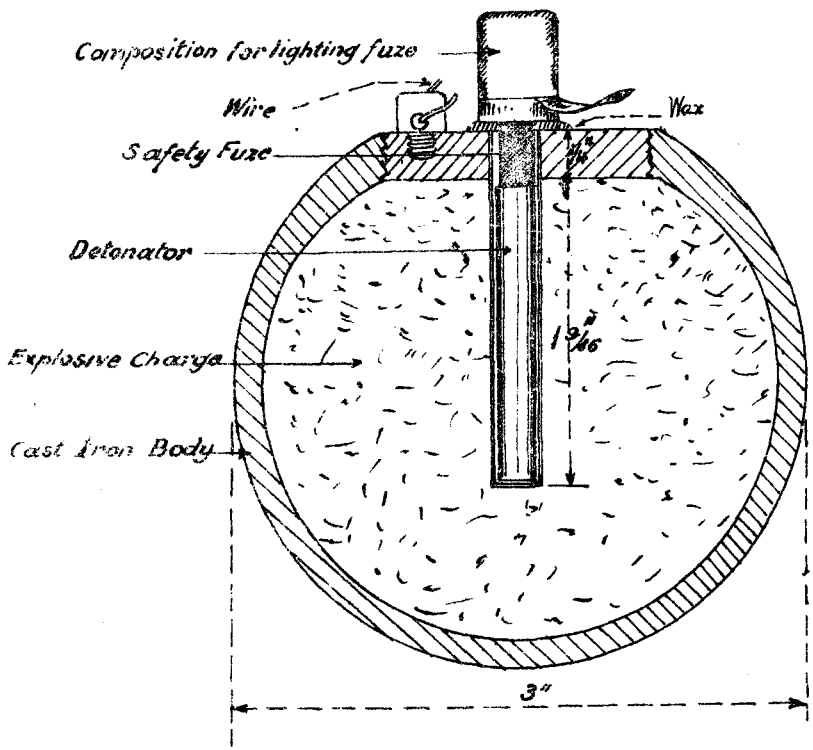


Section.

FULL SIZE.

Plate 25.

BALL HAND GRENADE.

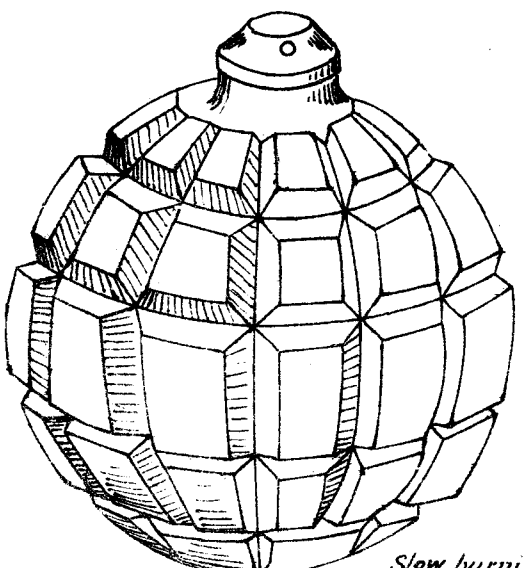


Section.

FULL SIZE.

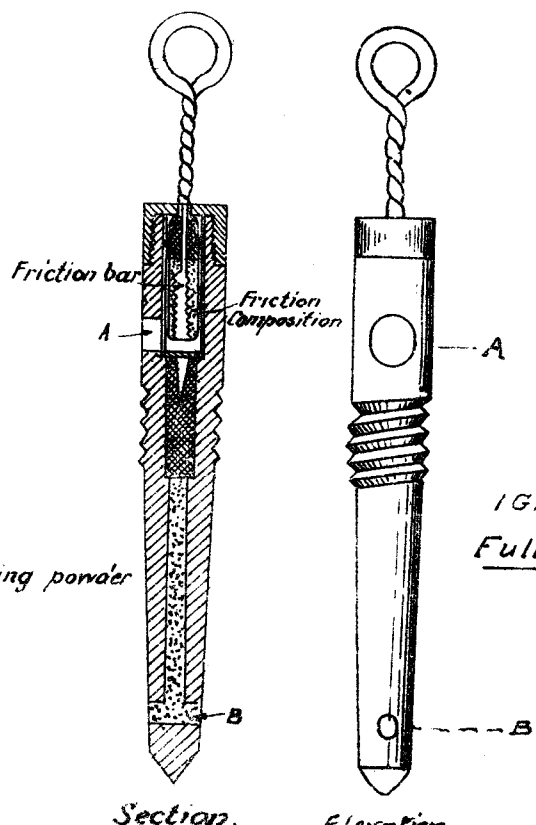
German Hand Grenades

FIG. 1.



SCALE 2/3

FIG. 2.



Section.

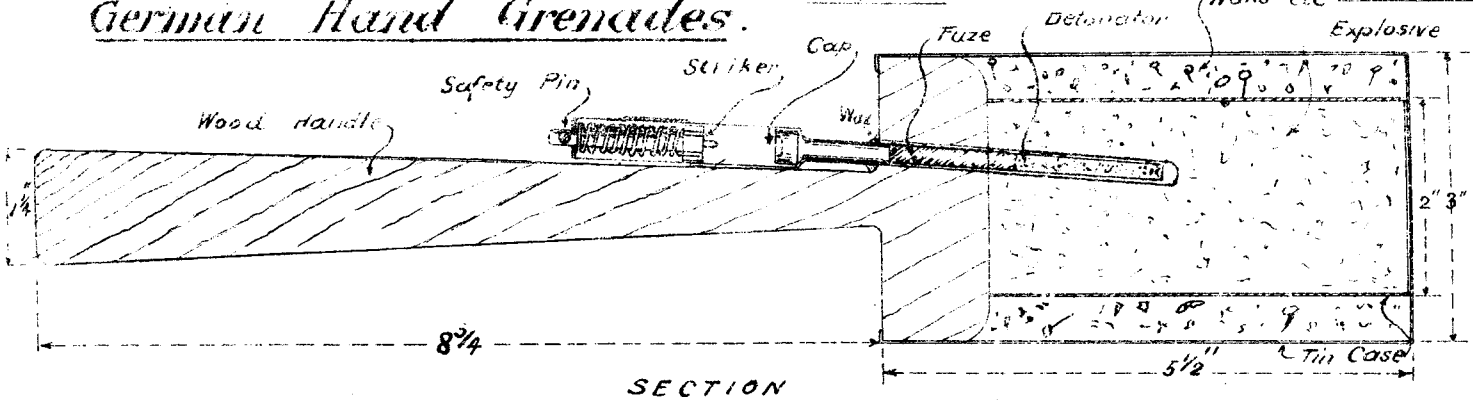
Elevation

IGNITER
Full Size.

German Hand Grenades.

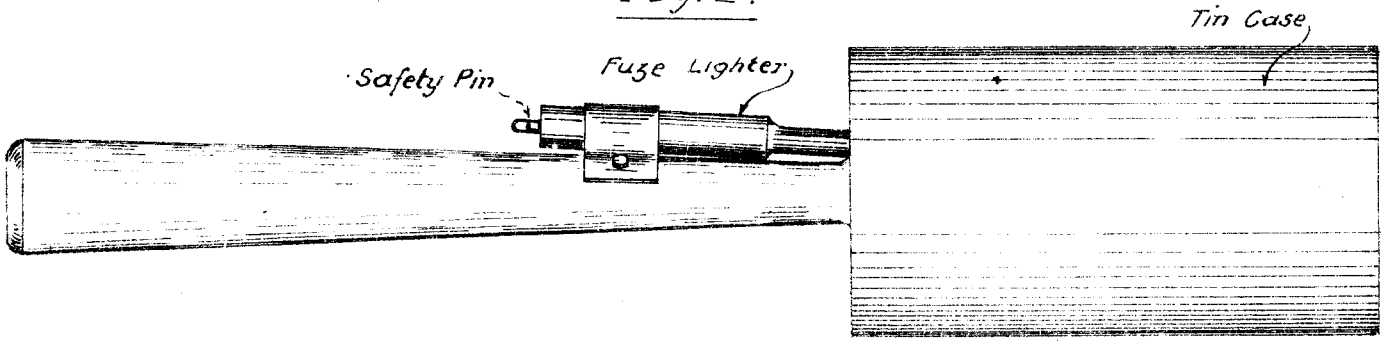
Plate 27

Fig. 1.



SECTION

Fig. 2.



ELEVATION

Fig. 3.

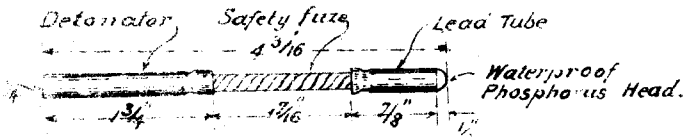
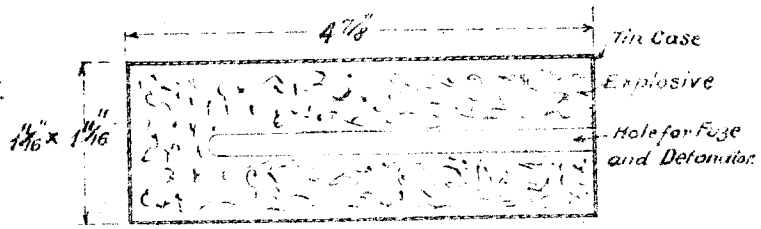


Fig. 4.



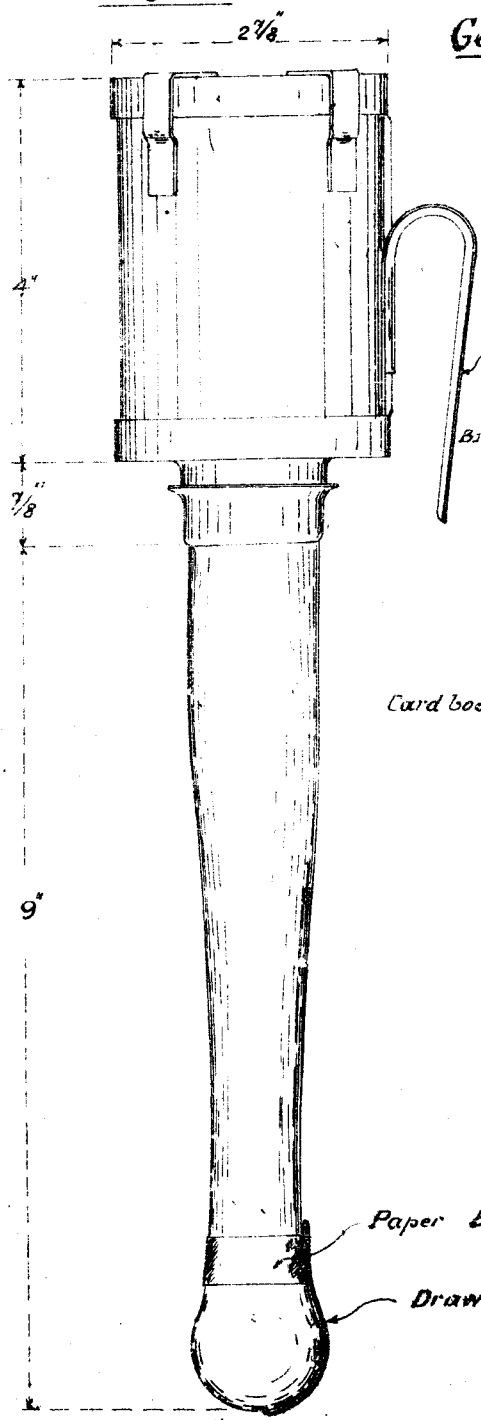
SCALE 1/2

(601)

Plate 28.

German Hand Grenades.

Fig. 1.



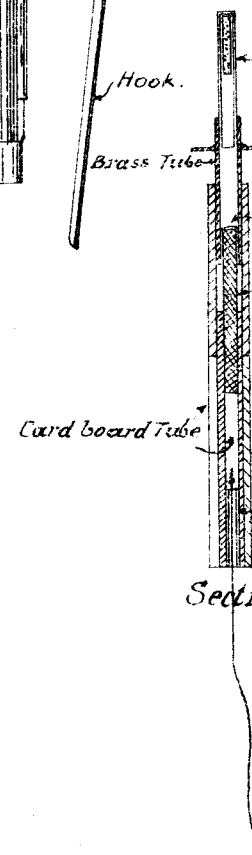
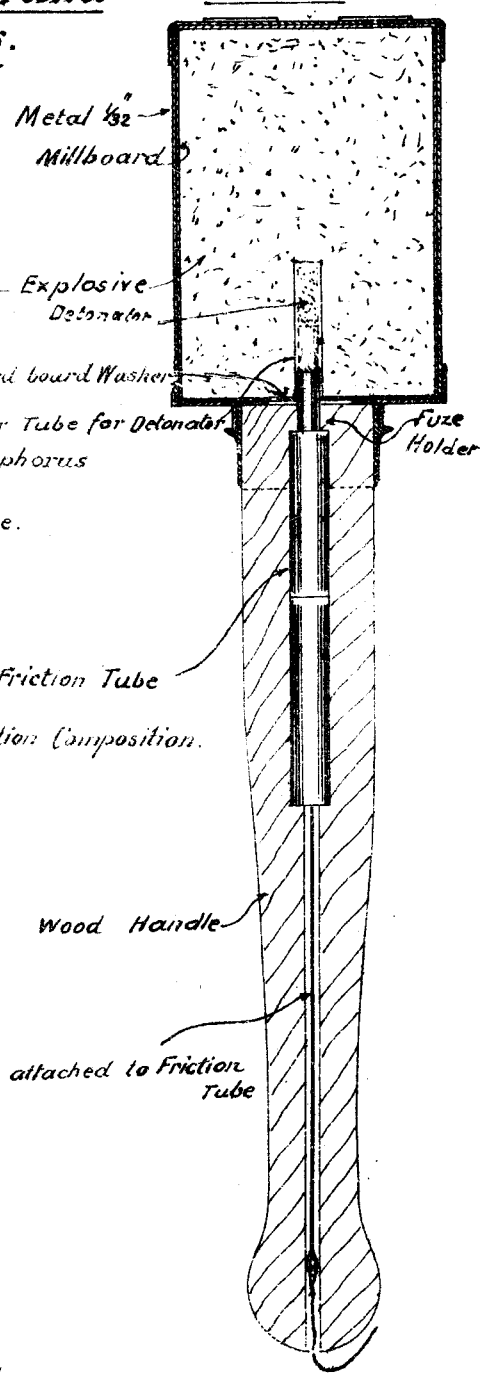


Fig. 2.

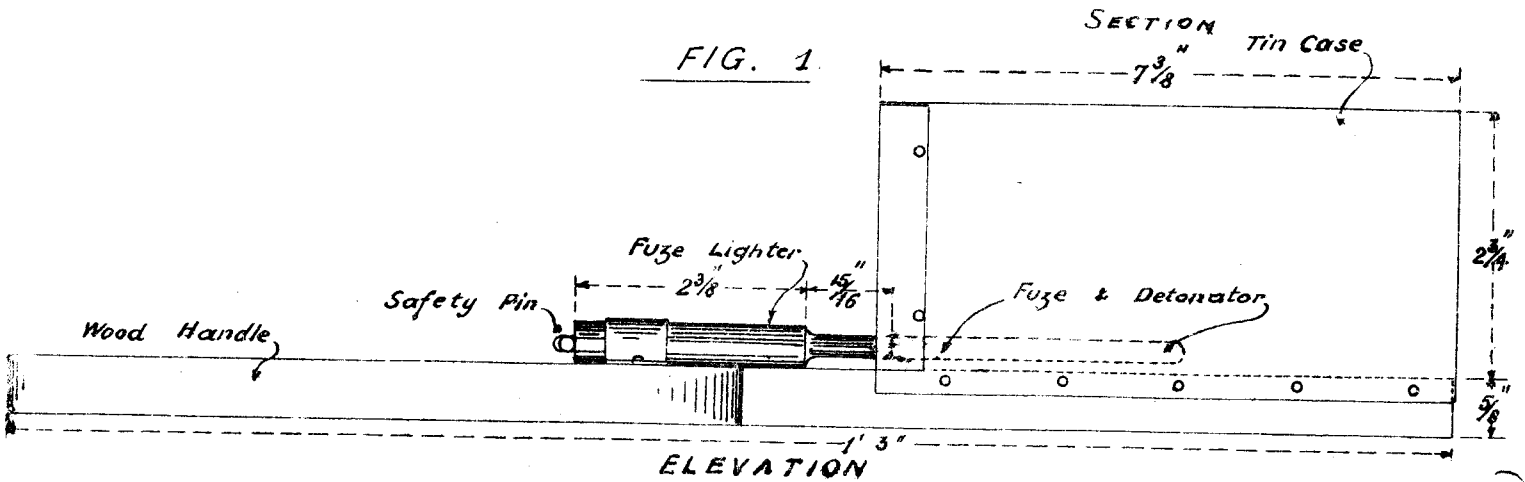


SCALE 1/2.

German Hand Grenades.

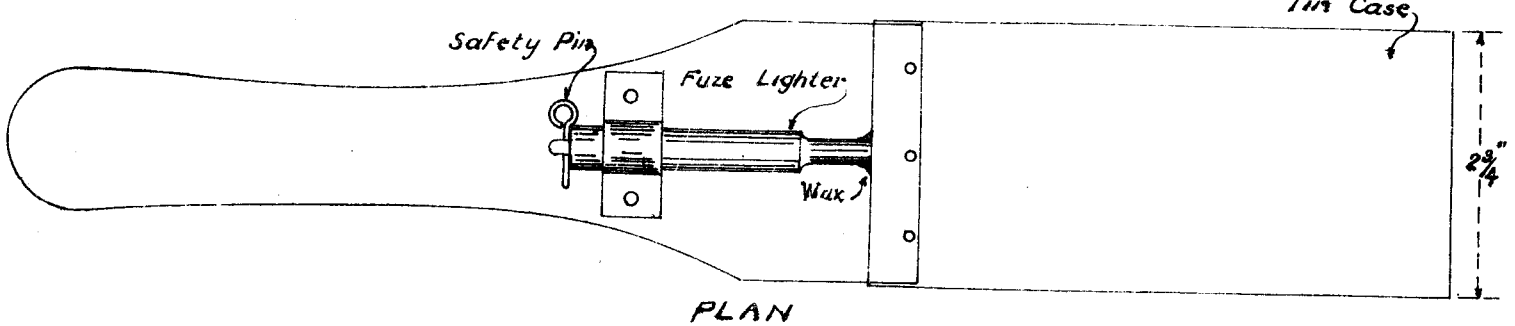
Plate 29

FIG. 1



ELEVATION

FIG. 2



PLAN

SCALE 1/2.

German Grenades

FIG. 1.

RIFLE GRENADE 1913

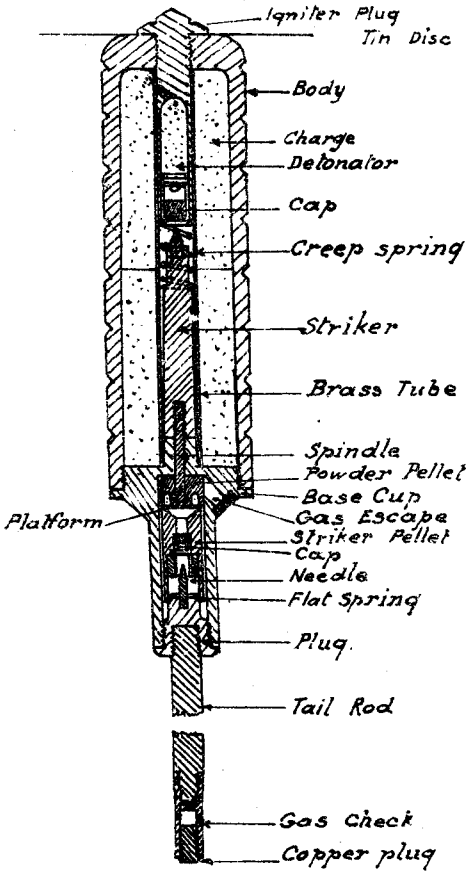


FIG. 2

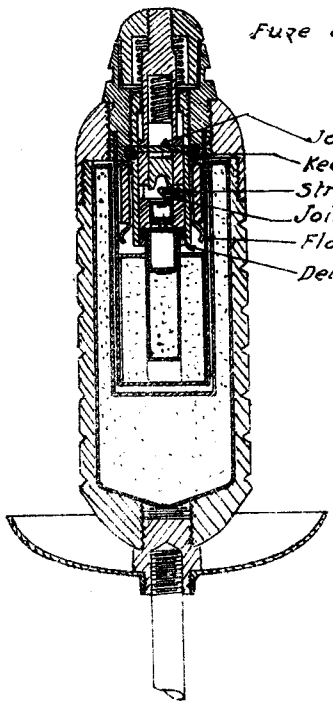


FIG. 3.

RIFLE GRENADE. 1914

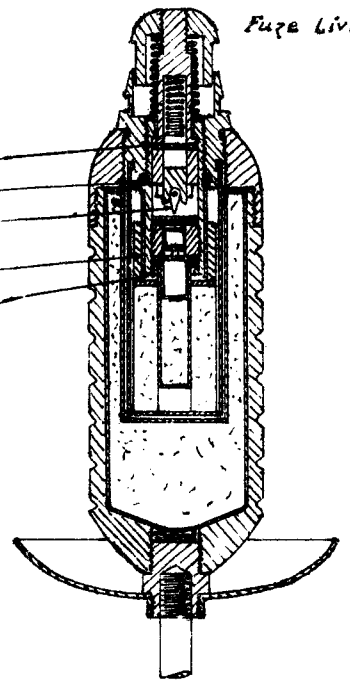


Plate 31.

German Grenades

Fig. 1.

RIFLE GRENADE 1914.

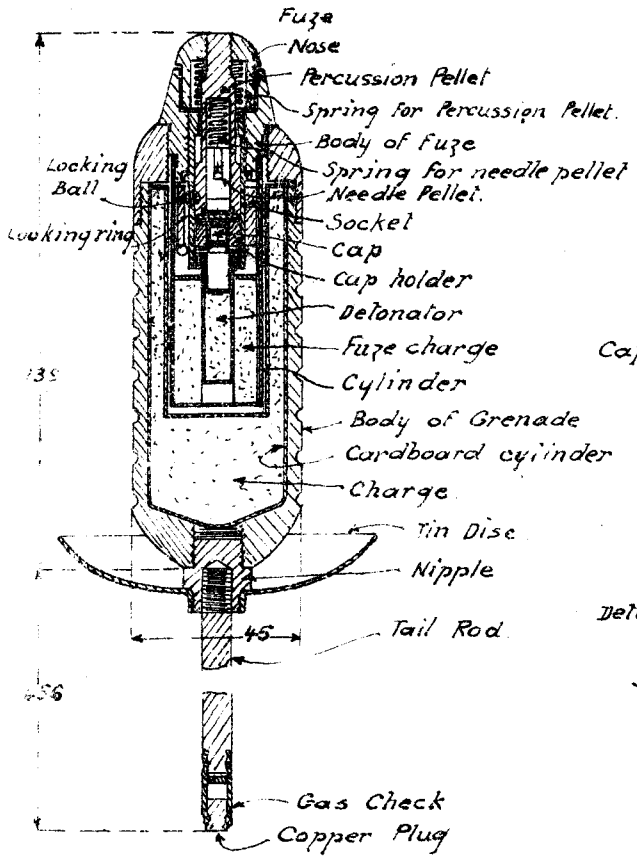


Fig. 2.

DISC HAND GRENADE

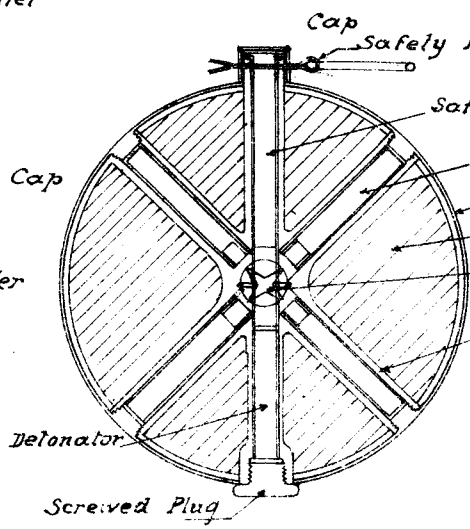
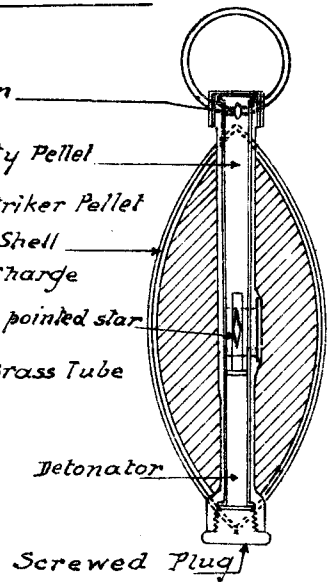


Fig. 3.

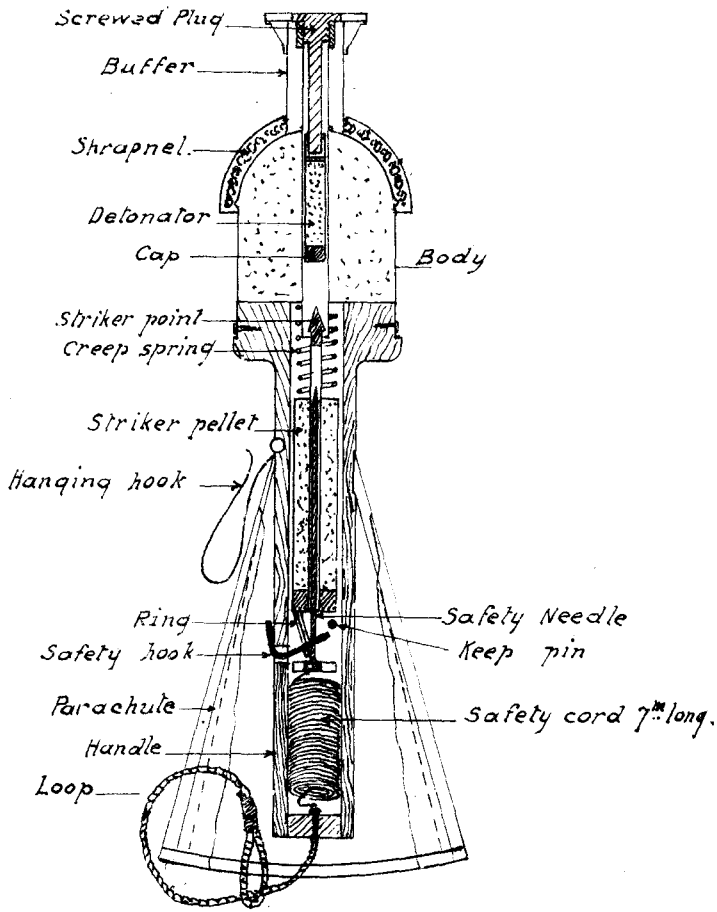


(64)

German Grenades.

Plate 32

PARACHUTE HAND GRENADE



French Hand Grenades.

Plate 33

Fig. 1.

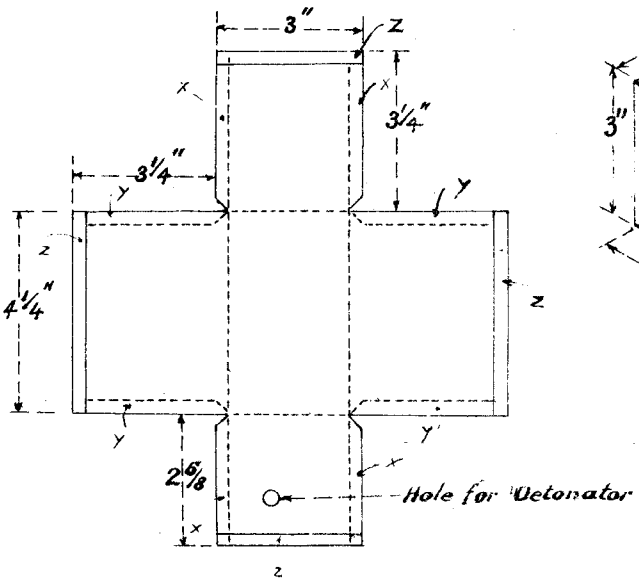
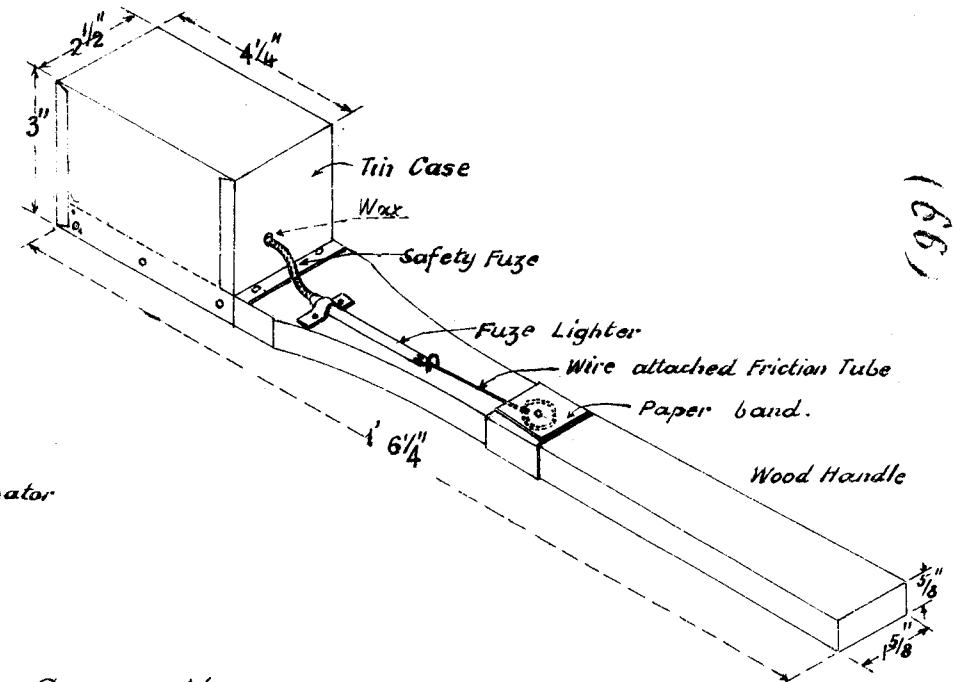


Fig. 2.



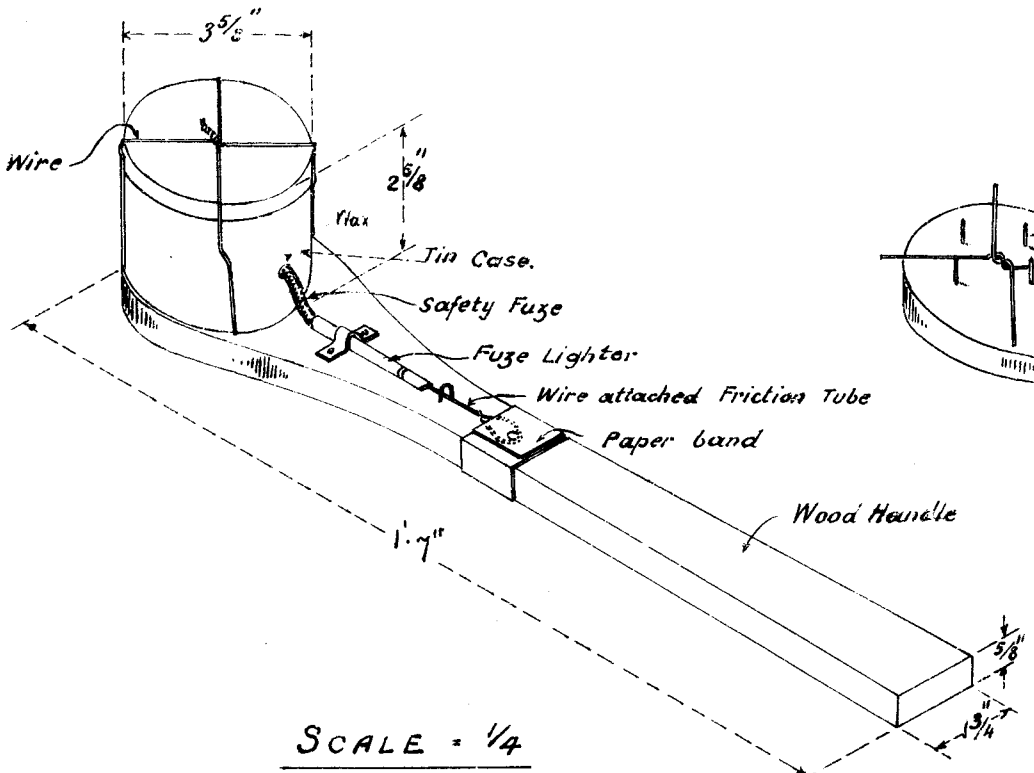
SCALE: ¼.

(66)

French Hand Grenades.

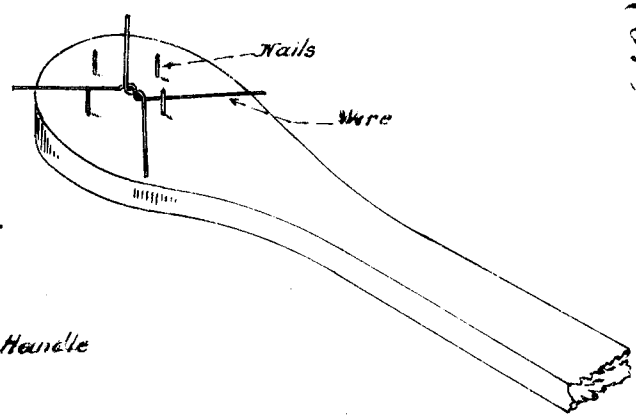
Plate 34.

Fig. 1.



SCALE = 1/4

Fig. 2.



(1571)

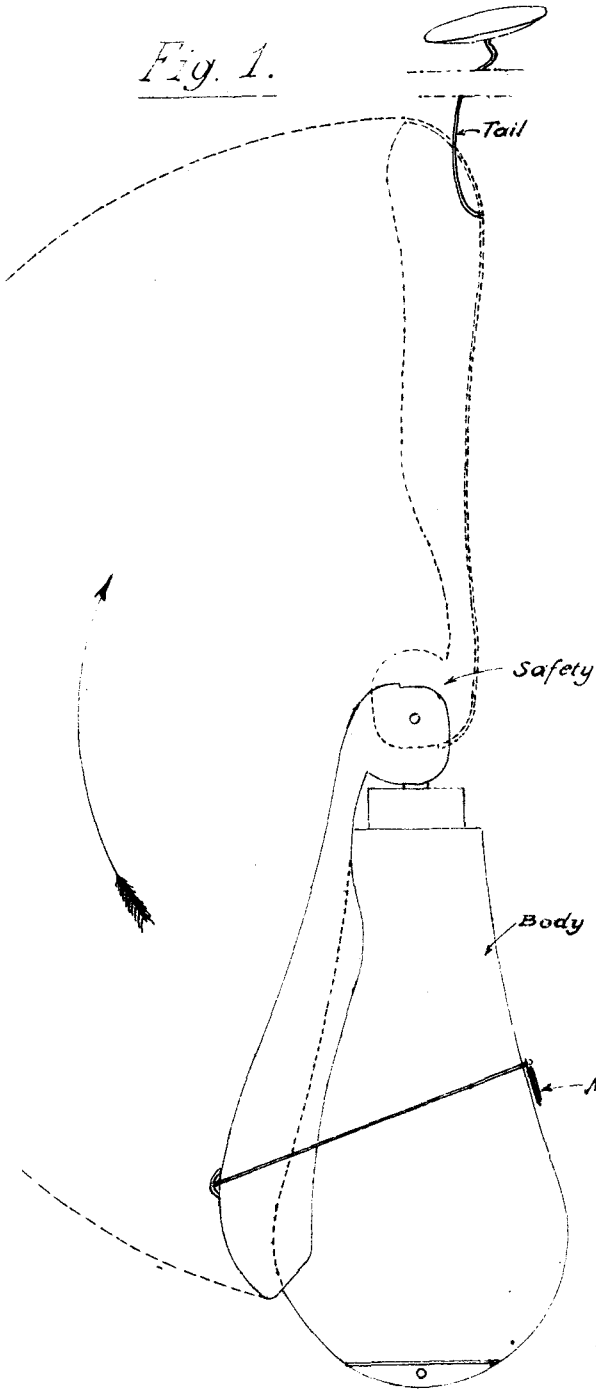
French Hand Grenades.

SCALE 3/4 APPROX.

Plate 35.

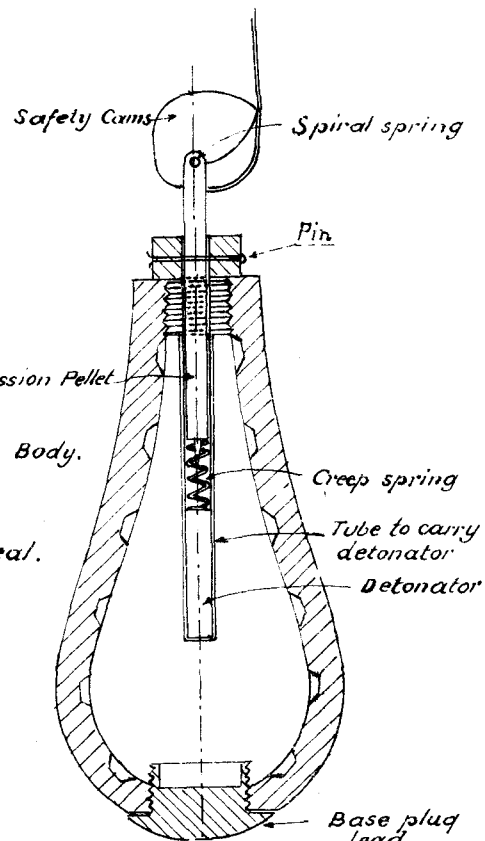
Fig. 1.

PEAR SHAPED GRENADE.



Elevation

Fig. 2.

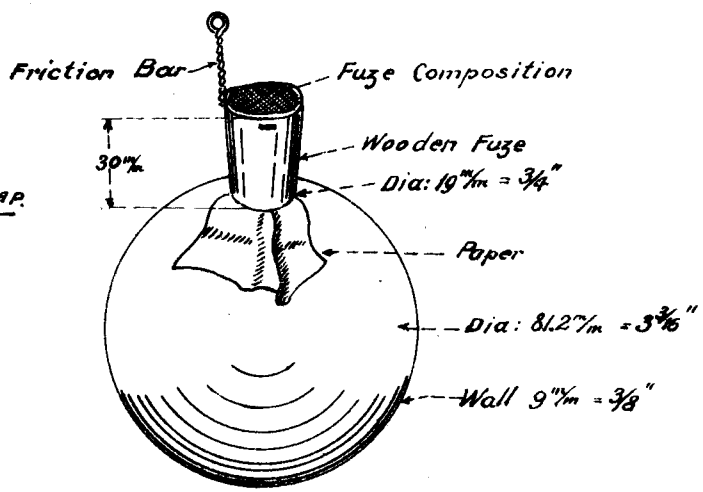


Section.

French Hand Grenades.

Plate 36.

FIG. 1.



BALL GRENADE AND STRAP.

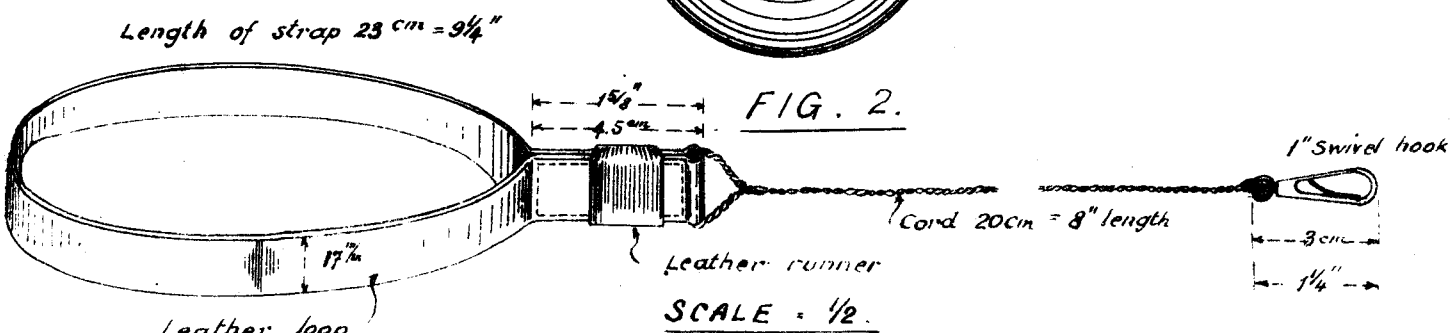
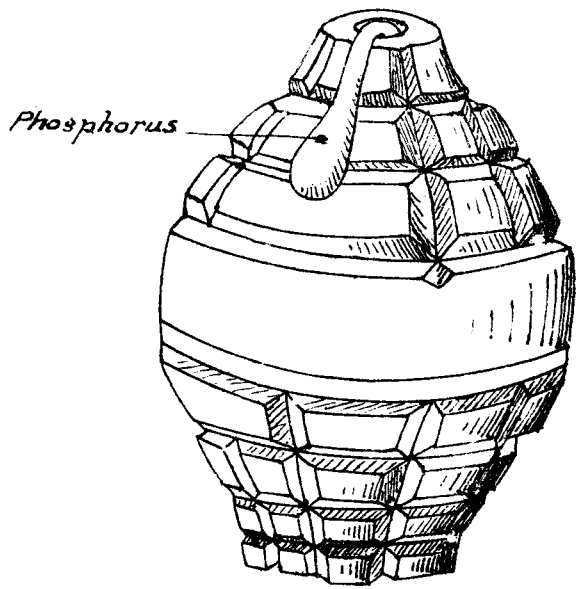


FIG. 2.

SCALE = 1/2.

Plate 37.

French Hand Grenade. (Besozzi)



Method of Igniting.

Plate 38.